Rubber Journal and International Plastics

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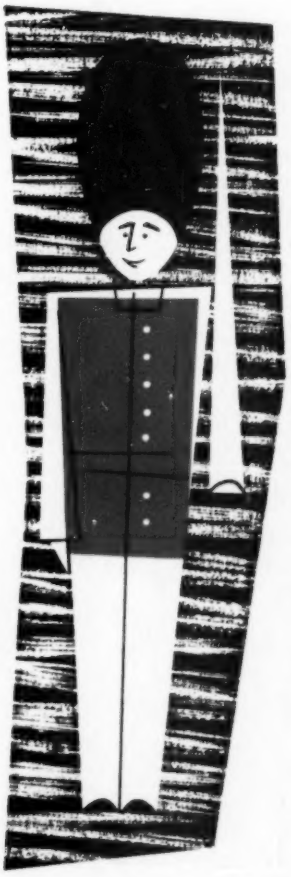

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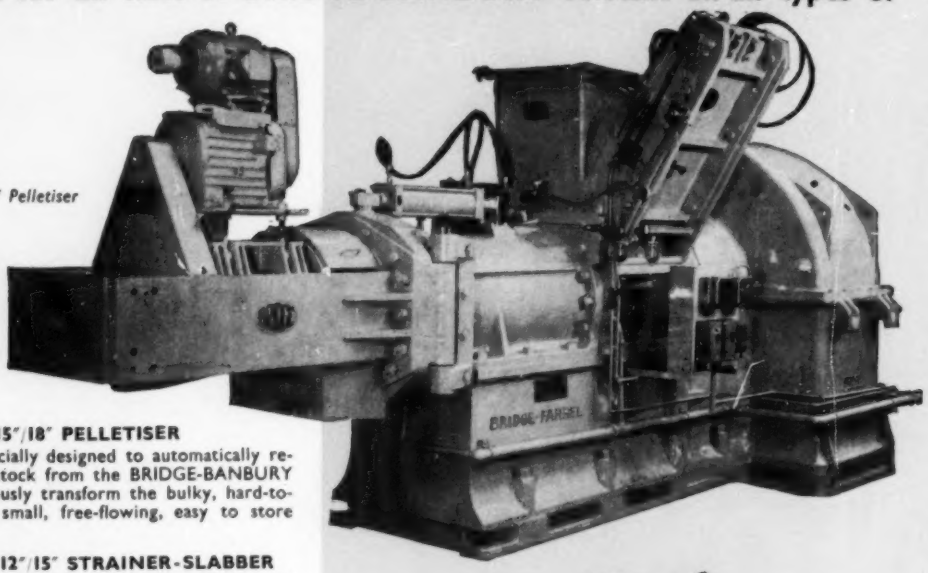

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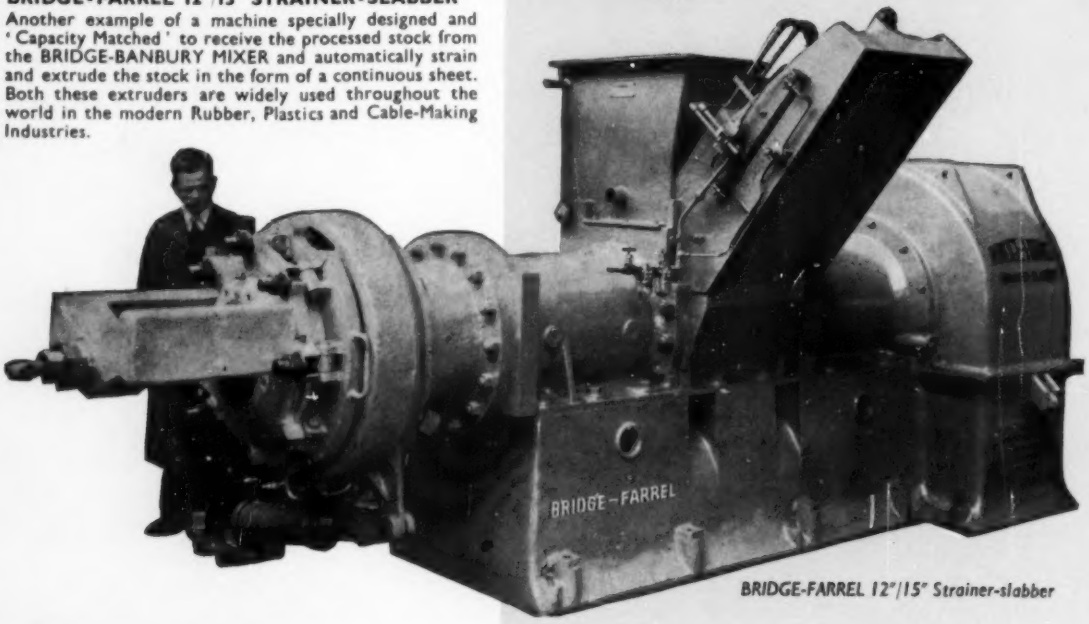

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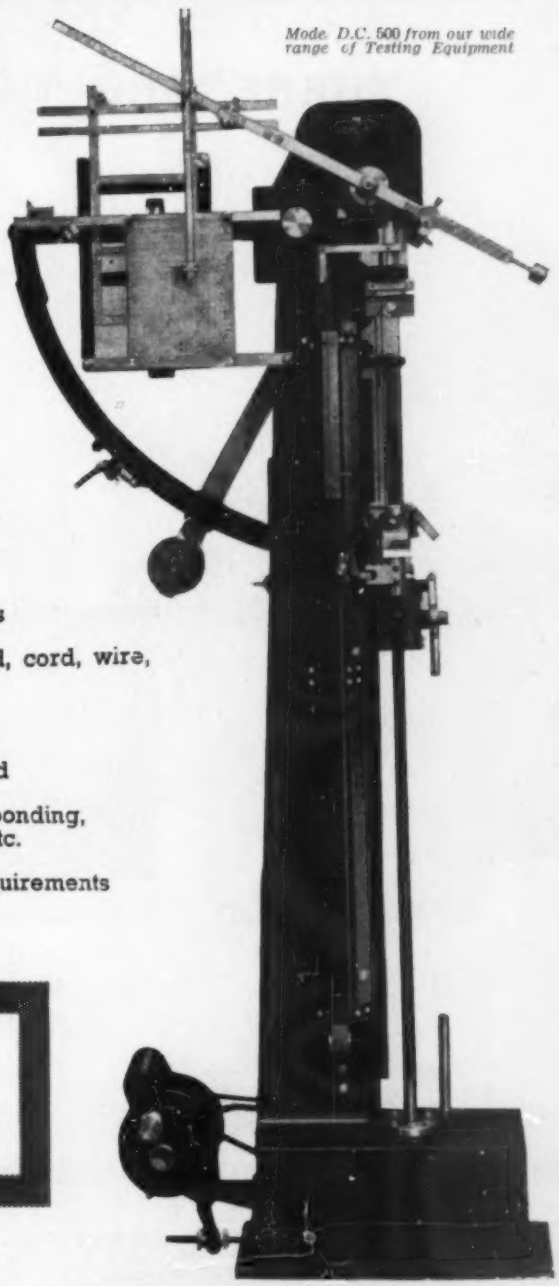

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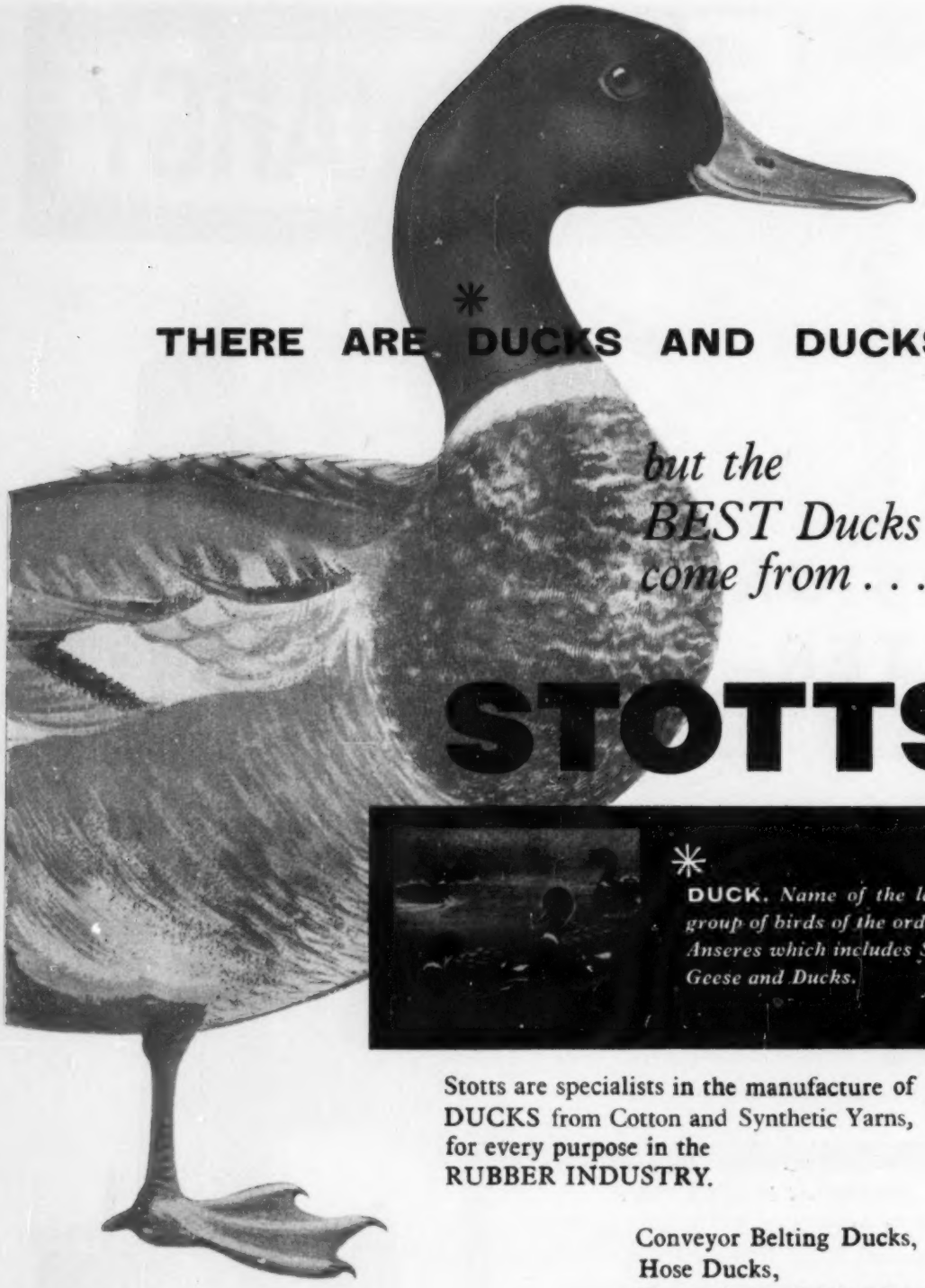

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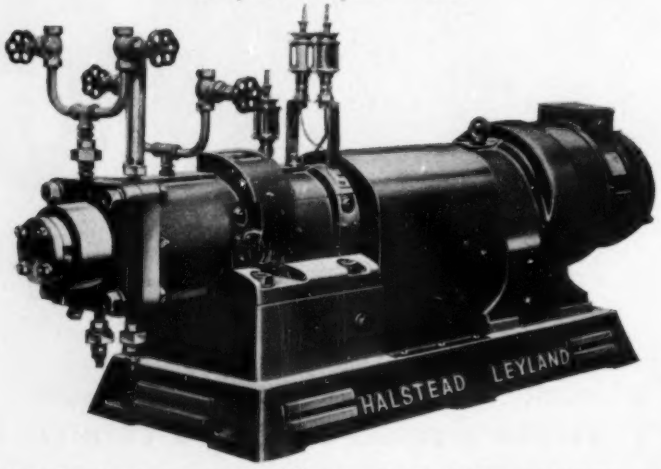

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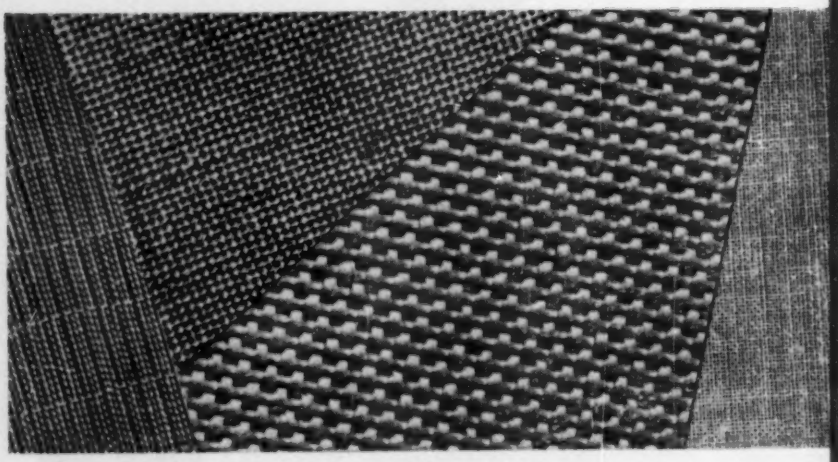

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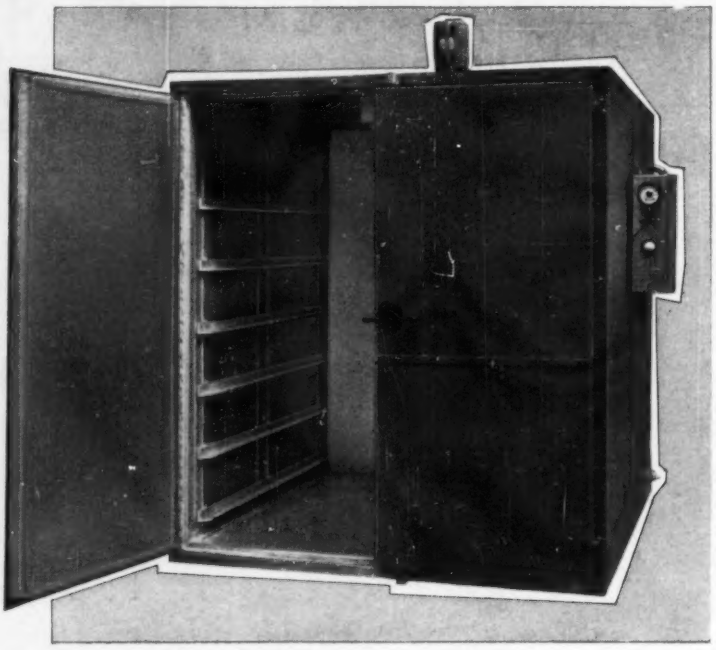

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PG 101

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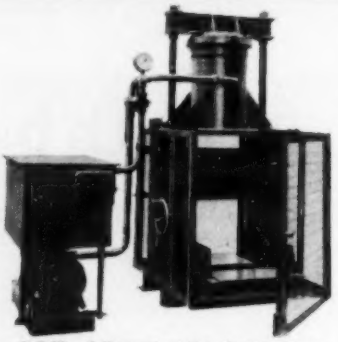
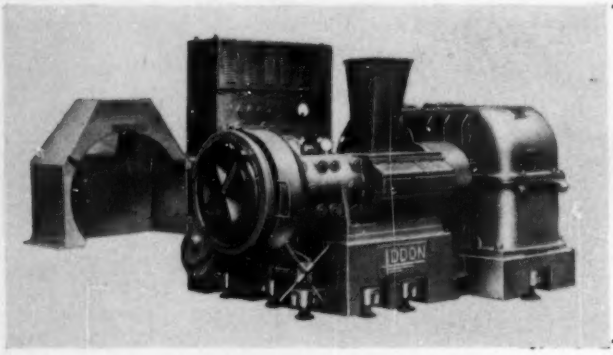
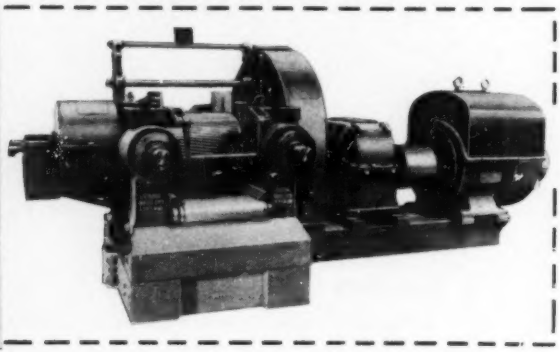


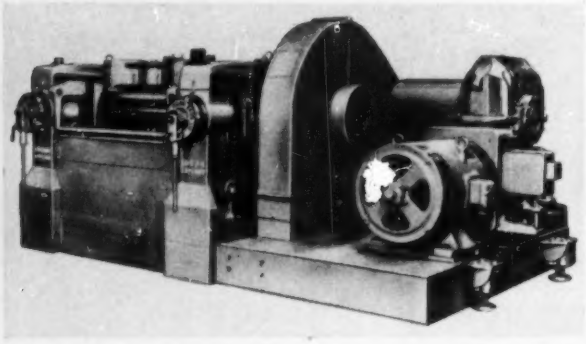
C.C.18.—Self-contained Bale Cutting Press and Pump with bale feeding attachment.



C.A.9.—Heavy duty Straining Machine, driven through double helical gear unit. Bayonet type locking head fitted with motor driven rotary cutter knife. Complete machine mounted on vibro-insulators.

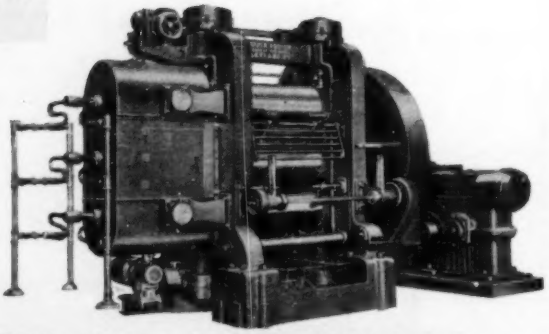


C.A.6.—Heavy duty single geared Cracker with take-off conveyor. Machine mounted on fabricated sub-frame fitted with vibro-insulators. Rolls 20in. dia.



B.Y.11.—Heavy duty single geared Mixing Mill with backshaft drive. Mounted on fabricated steel bedplate fitted with vibro-insulators. Rolls 22in. dia.

B.J.6.—Heavy duty 3-roll Calender with even and friction speeds and electrically operated roll adjusting gear. Rolls 20in. by 40in. face.



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IN ITS 77th YEAR

December 31 1960

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NOTES of the WEEK

Doctor in the Factory

IN a foreword to a new Ministry of Labour publication on industrial health, issued recently, the Minister, John Hare, says that more than 300 million working days are lost each year in the UK because of sickness or injury. ' If we can reduce this figure,' he states, ' we shall at once cut down human suffering, and make a contribution to our national prosperity.'

The booklet, ' Health at Work,' gives 14 examples of individual health schemes operating successfully in factories in different parts of the country. The polymer industry has always been in the van so far as health and safety are concerned, but we hope that these examples will encourage any laggards to follow suit. It is not simply a question of altruism: it makes commercial sense. Not only will days ' off sick ' be saved —and therefore money—but the security engendered by a health service tends to raise the output of the factory population as a whole.

The booklet, although not on sale, is being widely distributed to factory occupiers by H.M. Factory Inspectorate. It deals with such questions as how factory medical services are organized, and what they achieve, the attitudes of workers to their introduction and the advantages derived by both employer and worker. In carrying out the survey, the Ministry obtained from each factory details of the nature of the work done there, the organization of the medical services, the work of the medical officers and nursing staff, and the cost of each scheme. Four of the factories employed from 231 to 300 workers; five employed from 500 to 1,000; three from 1,000 to 5,000; and two more than 5,000.

An interesting example quoted in the booklet is a firm making carbon black by the oil-furnace process. A part-time works' doctor has been appointed and there is an ambulance room run during the day by a trained attendant. The factory employs 182 and the total cost—including salaries and medical supplies—is about £5 per employee per year. (This is rather high—of the 14 schemes described, seven cost £2 or less per head a year, five cost between £2 and £3 and the other two over £3.)

Quite apart from the ethical viewpoint, there is a considerable return on this expenditure. We know of firms where the cost has been more than outweighed by the savings in time lost. And there are other benefits that are not apparent on a cursory examination: the medical unit, for example, may be used in pre-employment selection. It would certainly pay anyone who is hesitant about setting up a medical unit in his factory to read this booklet. Is there a doctor in your factory?

Steps Into EFTA

TO a certain extent UK industrialists have played down the marketing possibilities of the EFTA. It is early days yet, of course—only a few months since the first 20% tariff cut was made—but not many companies or associations have examined the commercial opportunities that lay within in the Seven. It is good to see that rubber and plastics figure prominently in the few approaches that have been made.

I.C.I. have made heavy space bookings in the EFTA press, and the Federation of British Rubber and Allied Manufacturers is preparing to bring out an illustrated booklet, printed in five languages—a separate edition for each language—which will outline the UK industry and give a comprehensive list of rubber products. The booklet, which has been initiated by the Overseas Trade Committee of FBRAM, will be mailed to all EFTA countries and will open up the way for follow-ups by individual rubber companies. The Overseas Trade Committee, with the help of the Board of Trade, has prepared a mailing list of 12,000 names, including important industrial users, merchants, importers and department stores. These lists will be available to major supporters of the scheme.

There are more than 300 trade associations in this country. So far as we can find the FBRAM is the first to make such a strong promotional move into the EFTA. This pioneer effort deserves support from all rubber firms—who may be sure that big export dividends will be the reward of co-operative effort.

Membership Resolution

ANOTHER recent development of the FBRAM is the decision that the Federation should change over to direct membership by individual firms from April 1, 1961. As we said on this page when the decision was announced, this is a rational move. It should give the Federation a wider support throughout the industry, without losing the benefits of the specialized experience gained by the various associations. And it should provide a broader basis for the widening of the Federation's activities, of which the EFTA booklet is just one example.

Full details of the direct membership scheme have been sent to firms. On the brink of 1961 we cannot think of a better new year resolution for a firm to make than to send in an application for membership now. Details can be obtained from the Federation at 43 Bedford Square, W.C.1. The benefits springing from the Federation will ensure that this is a resolution that, once made, will certainly be an easy one to keep.

NEWS *Briefs*

US PLASTICS SALES STEADY—GOODYEAR FOAM UP—RUSSIA-CUBA PACT—GHANA CO-OPERATIVES HULS PVC PIPELINES—DUTCH FORMALDEHYDE

●**Belgium** — Shares of Farbwerke Hoechst have received an official quotation on the Brussels Bourse.

●**South Africa** — Owens-Corning Fiberglas Corp. has acquired a substantial minority interest in Fibreglass South Africa (Pty.), producer of thermal insulation products. The other share owners are Plate Glass and Shatterprufe Industries, South African manufacturer in the flat glass field, and the UK firm Fibreglass Ltd.

●**Greece** — The Minister of Industry has said that the cost of industrial projects so far under the Five-Year Plan has been $465m. These projects include the polystyrene plant being built near Athens by Dow Hellenic Chemical, a subsidiary of the US firm.

●**Holland** — The Netherlands Government recently submitted to the Second Chamber of the States-General bills concerning a number of tax measures, including a rebate of the luxury purchase tax on tyres, cars and motorcycles from 20% to 18%. The Government plans to make the revisions effective as from July 1 1961.

●**Cuba** — Soviet contracts totalling around 21m. pesos have been announced by the Cuban Foreign Trade Bank. Under contracts signed by the Soviet overseas trade vice-minister, Mikhail Kuzmin, Russia will supply machinery and raw materials, including 500,000 pesos worth of asbestos and celluloid.

●**Holland** — In conjunction with the US concern Pittsburgh Plate Glass, AKU is to establish a glass yarn and fibre factory in Holland.

●**Ghana** — President Nkrumah has visited Ghana's first co-operative farm, which includes a rubber plantation, set up at Vakpo, near Kpanda, in the Volta Region. The farm has now passed the experimental stage and the Government has decided to go ahead with the establishment of co-operative farms in various parts of Ghana.

●**United States** — Dow Chemical Co. said it is increasing the price of polystyrene plastic by one cent per lb. to 19 cents. This move follows a general lowering of polystyrene prices to 18 cents per lb. from 21½ cents per lb. by other makers. Dow said it is acting 'because recent price trends cannot be justified and are unhealthy for the whole plastics industry, fabricator and supplier alike.'

●**Holland** — The Netherlands rubber firm, NV Vredestein, has established the 'AB Vredestein Nordiska' company in Stockholm to handle sales of its tyres and other rubber products in Sweden and the rest of Scandinavia.

●**Brazil**—Formation of a new company to manufacture and market laminated plastics in Brazil has been announced by Cyanamid International, a division of American Cyanamid. The new company, Formica Plasticos, S.A., was formed through the purchase by Cyanamid of the plant and assets of Plasticos do Brasil, S.A., formerly the lincensee for Formica in Brazil. Total Cyanamid capital investment is approximately $2m.

●**United States** — Sales of all plastics this year in USA have matched the record set last year of 5.6 thousand million lb. according to W. R. Grace and Co. The company noted that both 1959 and 1960 showed a sales increase of 25% over 1958. Polythene again led the way with sales estimated at 1.26 thousand million lb. Grace reported that this figure for polythene in 1960 exceeded all previous records set by other types of plastics. Decreases in sales were recorded for phenolics but the polystyrene figure was 3m. lb. up at 933m. lb.

●**West Germany** — Chemische Werke Hüls AG is producing PVC pipelines in rolls of 1,000 metres each for the transport of water or for drainage. The company says the new pipelines should be particularly advantageous to underdeveloped countries as they are cheap, light, and easy to lay.

●**Holland** — The Dutch State Collieries is to establish a factory for the production of formaldehyde at Limburg. The capacity of the factory will be 25,000 tons of a 40% solution of formaldehyde a year, more than the present consumption in the Netherlands.

●**United States** — Goodyear is to increase the price of its latex foam for furniture upholstery and allied fields on January 10. The price of pin core airfoam will be increased by 3%. Airfoam slab and Pliofoam, the company's polyurethane cushioning, will not be affected.

'I look at it this way — any sort of dividend is better than no dividend at all'
—517

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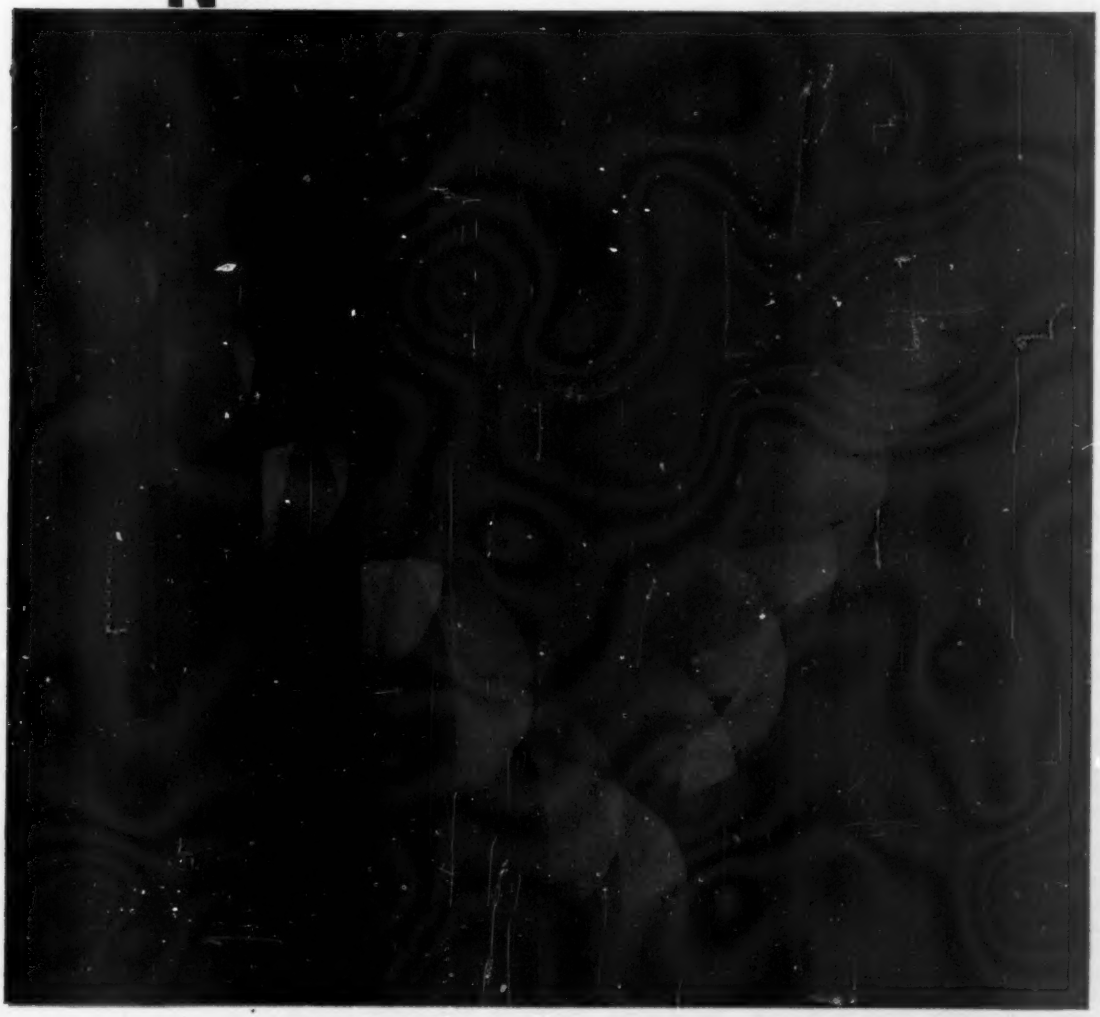


Polybutadiene in Truck Tyres

PRODUCTION STARTED BY US RUBBER

PRODUCTION of truck tyres with treads containing a blend of polybutadiene synthetic and natural rubber has been started by the US Rubber Co., it has been announced in New York.

This is the first commercial use of polybutadiene and US Rubber says that it marks the second major step toward the replacement of natural rubber in heavy service tyres since they started production of truck tyres with polyisoprene in March 1959.

Until now, all large size truck tyres have been made with either natural rubber or polyisoprene to cope with the high temperatures generated in big tyres running at high speeds under heavy loads. The use of polybutadiene as a tyre material is said to have been made possible by the development of a special compounding and processing method.

Polydiene Production

The availability of polybutadiene and polyisoprene is due to increase rapidly. Production facilities now being completed are expected to bring the manufacturing capacity for these two synthetics to 225,000 long tons a year by the end of 1962.

'If achieved, this would amount to about half the present total annual usage of natural rubber in the US. By far the biggest part of this total of 500,000 long tons of natural rubber goes into heavy service and earth mover-type tyres,' US Rubber Co. said.

DCL's £29m.

The new developments announced during the past year by Distillers, its subsidiaries and associated companies, will involve a total capital expenditure of some £29m., covering all branches of the organization, the company has stated.

On the industrial side, significant additions to chemical and plastics plants have been made or undertaken at Hull, Barry (Glamorganshire) and Sandbach (Cheshire). The company mentions 'the striking progress' made by British Hydrocarbon Chemicals Ltd. (jointly owned by Distillers and British Petroleum).

Plans for further extensions at BHC's site at Grangemouth, Scotland, were carried into effect, and a major landmark in that company's history was the announcement last October of the proposal to erect a new petrochemical plant at Baglan Bay, near Port Talbot, South Wales, broadly on similar lines to that of Grangemouth.

The 1961 Furniture Show will be held at Earls Court from February 1-11.

BICC Reorganization

British Insulated Callender's Cables is to transfer the manufacture of plastic cable and associated products from Telcon Works, Greenwich, to other factories of the group.

Production at Greenwich will henceforth be exclusively submarine cables and marine engineering products.

It is expected that these arrangements will become fully effective by the end of next year.

Methyl Methacrylate Price Cut

EIGHT MORE MATERIALS REDUCED BY I.C.I.

A CUT of £8 10s. a ton in the price of methyl methacrylate has been announced by Imperial Chemical Industries. Methyl methacrylate is the monomer for I.C.I.'s Perspex acrylic sheet and Diakon moulding powder.

This is the most important of a number of price cuts, which add eight more substances to the list of chemicals which have been reduced in price this year. According to I.C.I., most of these latest cuts derive from increased production capacity for higher chloromethanes.

Alloprene chlorinated rubber, used in paints, adhesives and printing inks, has been reduced by £10 a ton. Other materials affected include methylene chloride, trichloroethylene and perchloroethylene.

General Fall

These reductions are part of a general fall in chemical prices which have been taking place throughout the year. Other important price drops announced recently have been in Midland Silicone's Silastomer silicone rubbers (2s. a lb.) and I.C.I. and Shell's propylene glycol (*RJIP* December 24, 1043 and 1065.) Propylene glycol, whose uses include the manufacture of polyester resins, is to be reduced by £5 a ton on January 1.

Most manufacturers point to increased production capacity as the main reason for these price cuts, but a subsidiary reason may be that the chain of slackening demand stemming from the car and consumer goods industries has reached these raw materials.

Oil-expanded Royalty

Under the recently awarded US patent for making oil-extended SBR synthetic rubber (*RJIP* December 24, 1043), the General Tire and Rubber Co. is asking other tyre manufacturers for a royalty of ¼cent for each lb. of oil-extended synthetic rubber used in tyre treads.

Based on the General Tire's estimate of annual consumption of oil-extended synthetic in tyres, the royalties on the patent could amount to about $3.9m. annually if the company should succeed in licensing all other users of the process.

The company has offered licences under the patent to the entire rubber industry, and has filed suits in Cleveland against Goodyear Tire and Rubber and US Rubber for alleged infringement of the patent.

Raymond C. Firestone, president of Firestone Tire and Rubber Co. of Akron, has been elected to the advisory committee of the transportation centre at Northwestern University.

£1.25m. Cable Order Awarded to Pirelli

PIRELLI - GENERAL Cable Works, of Southampton and Eastleigh, have obtained a £1.25m. contract for cable manufacture and installation. It has been awarded by the Central Electricity Generating Board.

The cable is to be installed in London commencing February or March 1961. 165,580yd. of 132kv single core cable and 55,000yd. of auxiliary cable will be laid from Holborn to St. Marylebone, and from Finchley to Mill Hill.

The contract is scheduled for completion by November 1961.

J. W. Keener, president of B. F. Goodrich has been presented with a distinguished service award by Birmingham-Southern College in Birmingham, Alabama.

RAPRA London Meeting

CONTINUOUS VULCANIZATION IN FLUIDIZED BED

FOLLOWING successful regional meetings in Cardiff, Glasgow, and Manchester, the Rubber and Plastics Research Association of Great Britain held its London regional meeting at the Piccadilly Hotel recently. A well balanced programme included luncheon, statements on policy and current work at Shawbury, four short informal lectures, and a general discussion of the lectures and Shawbury affairs. About 150 representatives of the member firms of the Association were present including the president of the Association, Mr P. W. Howard, and guests included Dr L. Bateman (NRPRA), Mr G. E. Holmes-Siedle (IRI), Dr W. M. Hampton (DSIR official visitor) and Mr S. C. Covell (FBRAM).

Mr L. R. Mernagh, honorary treasurer (Firestone), acted as chairman, and in his remarks he stated that this was an historic occasion — the first meeting of the Association under its new name of the Rubber and Plastics Research Association of Great Britain. The new members representing the plastics industry would cover a very wide range of the interests of that industry, and the rubber industry looked forward to welcoming them into the Association. Dr W. F. Watson, the Director of the Research Association, assured the members present that there would be no slackening in the work done at Shawbury for the rubber industry, and that co-operation between the two industries would be to their mutual benefit.

After the luncheon there was an informal session of lectures. Dr Watson outlined the current work being done at Shawbury. Four talks then followed: 'A Recent Russian Visit' by Mr R. C. W. Moakes, 'Management and Productivity' by Mr T. J. Daniel, 'Improved Ageing Tests' by Dr J. Scanlan, and 'Continuous Vulcanization' by Mr A. L. Soden.

Russian Visit

In giving the first of these talks, Mr Moakes referred to the visit to the USSR made by Dr Watson, Mr R. J. Moseley and himself, earlier in the year. During two weeks' stay in June they visited a large rubber factory, the Red Triangle works at Leningrad, and research institutes in Leningrad and Moscow. He described the organization of these places and described points of particular interest to technologists arising out of the visit.

At the Red Triangle works an air-bag method for the manufacture of rubber boots was seen. The boot was hand-built by a very simple process on a butyl rubber last acting similarly to a curing bag in tyre manufacture. The Russians stated that the method reduced the number of parts, and consequently the number of operations required, reduced the spew, gave greater tolerance on mould dimensions and produced a very flexible boot, besides permitting a 60% greater output than the conventional method. Mr Moakes also described a Russian method for accurately cold-stamping blanks for the manufacture of footwear, such as goloshes, to reduce wastage due to excess loading of moulds. Centralized control of moulding equipment, by which one engineer can control a large number of machines (in this case 66) was also seen.

Russian testing apparatus of interest included the 'Konditsimetr' (a development of the parallel plate plastimeter with electric heating) for evaluating the processability of mixed stock, an apparatus for evaluating the effects of light and ozone on rubber simultaneously, and apparatus for measuring stress relaxation under compression.

Financial Ratios

Mr Daniel's talk described the Association's work on productivity in the rubber industry. He said that the main effort in the productivity and interfirm comparison work is being devoted to a study of press shop productivity. The study covers not only the press shop itself but the associated processes of blank production and trimming. Among the things being examined are press utilization and machine interference, that is, delays which arise because the moulder has to wait for the press or the press for the moulder.

Mr Daniel stated that parallel with the studies of production processes, Shawbury has co-operated with the Centre for Interfirm Comparison, an organization set up by the British Institute of Management and the British Productivity Council, to interest the industry in comparisons of financial ratios of great value to management. By means of a comparison of such ratios as profits/capital employed, it is possible to provide firms with an indication of their general managerial efficiency and to indicate which aspect of a firm's activities could be responsible for their being in an unsatisfactory position compared with others.

A number of firms have agreed to exchange ratios and are now engaged in the preliminary work of defining terms and deciding on the most useful ratios. The work of the group will be organized by the Centre for Interfirm Comparison, with Shawbury acting as technical advisers for any points peculiar to the rubber industry. At the end of his talk Mr Daniel introduced Mr Ingham of the Centre for Interfirm Comparison, who answered a number of questions about this work.

Stress Relaxation

Dr Scanlan spoke next on ageing tests. He felt that most people would agree that a test of any type which gives fundamental physical or chemical information about molecular behaviour is more satisfying and in the long run more useful than one which merely measures the response of the material to a standardized set of conditions. As knowledge of the requirements as to fundamental properties for each type of service increases, such informative tests are likely to give economy in testing as compared with attempts to reproduce more or less completely service conditions in the laboratory.

Conventional ageing tests for vulcanizates in which the change in tensile strength or elongation at break is measured after oxidation under standardized conditions are not very useful from the fundamental point of view. The dependence of these properties on network structure is complex and very incompletely understood. On the other hand the stress-relaxation methods of following the ageing of vulcanizates provide simply a considerable amount of information on changes in the structure of the network.

Dr Scanlan explained that in stress-relaxation measurements the force exerted by a thin strip of vulcanized rubber when at a constant stretched length is followed during ageing.

Such force measurements can be interpreted by means of elasticity theory which shows that the force exerted should be proportional, at least approximately, to the number of chains in the network running between two cross-links.

Two variants of the method are useful: in the continuous measurements the strip is always stretched whilst in intermittent measurements the strip is unstretched for almost all of the time merely being stretched for short intervals periodically for force measurements to be made. The two different types of test give with many vulcanizates quite different results. This is because oxidative degradation of these vulcanizates is accompanied by cross-linking; cross-links are formed so as to be under no stress under their conditions of formation and those formed in the stretched strip leave the tension unchanged while those formed in the unstretched strip increase the tension on stretching. Thus the continuous relaxation measures only the degradation reactions while the intermittent gives the net effect of cross-linking and degradation and use of the two types of measurement together enables separate estimates to be made of the progress of the two reactions.

Extrusion Vulcanization

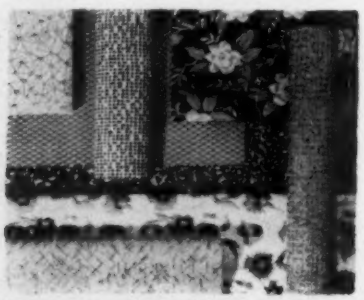
In his talk on 'Continuous Vulcanization' Mr Soden described the work in progress at Shawbury on the use of a fluidized bed of particulate material as a heat transfer medium for the continuous vulcanization of extrusions. The fluidized bed has a heat-transference of 40-50 times that obtainable with a gas and has advantages over the liquid baths which have been used, in that the liquids (such as molten metal) are dangerous and difficult to use. A further advantage is that the extrusions do not tend to float on the surface of the medium as they do with molten metal.

The speaker described a horizontal fluid bed, devised at Shawbury and a vertical bed 24ft. high is also under construction for development work. He described the construction of the fluid beds in detail, and pointed out that the process, which it was hoped would be of great benefit to the members of the Association, is the subject of patents.

Lively discussion followed the talks, particular interest being shown in the information brought back from Russia, and in the fluid bed continuous vulcanization technique.

Carter Appointments

V. L. Pinnock, M.S.M.A., has been appointed to the board of directors of B. and F. Carter and Co. Ltd., the cable, braiding, wire rope and hose machinery manufacturers. He has been sales manager of the company for 15 years.



These samples of supported and unsupported PVC upholstery fabrics form part of Storey's 1961-62 upholstery range

Rubber Gives Dam Protection

NEOPRENE AND HYPALON COATINGS USED

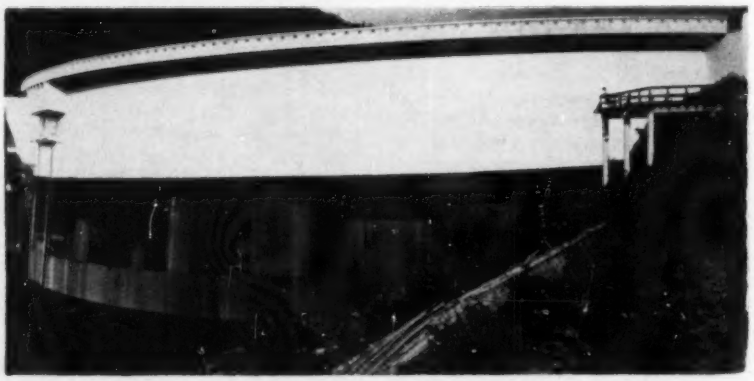
PROTECTION of the concrete arch of the Esch-sur-Sûre dam in Luxembourg against weathering and the water of the River Sûre demanded a reliable and easily applied proective coating on the dam both below and on the waterline. The coating materials chosen by the constructors were neoprene and Hypalon synthetic rubbers. These materials were specified for their resistance to weather, abrasion and corrosive waters.

The water of the River Sûre is very pure and therefore highly aggressive to metal and concrete. An added reason for using the synthetics was their ease of application. The paints were brush-applied by unskilled labour and there was no need for specialist applicators. The cost of application was therefore kept to a minimum.

The function of this 50 metres high arched dam is to regulate the flow of the River Sûre, which varies throughout the year from 60 to 100 cu. metres per second. Its capacity is 62m. cu. metres and its reservoir is filled from a catchment area in the Ardenne Mountains covering 428 kilometres. A small hydroelectric installation, working for four hours every day, produces 12m. kilowatt-hours annually. The Esch-sur-Sûre dam spans the river which is about 100 metres wide at that point. The dam, being curved, is approximately 150 metres long.

Black neoprene was applied to a thickness of one millimetre on the submerged part of the dam. A light grey coating of Hypalon, whose resistance to sunlight, weather and abrasion is better than neoprene coatings, was applied to the waterline area to a thickness of 0.4 millimetres. This area is alternately immersed in water and exposed to air.

These coatings are solvent solutions that are applied like ordinary paint but dry by evaporation of the solvent. Unlike ordinary paint, the films of both these materials do not harden or become brittle, but self-cure to a tightly bonded skin which will stay resilient over a long period of time.



Hypalon protects the dam above the waterline; below, black neoprene takes over

Wycliff W. Owen, a member of the textile fibres industrial sales section of E. I. du Pont de Nemours and Co., has joined Du Pont de Nemours International S.A. in Geneva.

AMERICAN LETTER — from Norman L. Hewitt

Activity in Polyolefin Films

IT has seemed to at least one observer lately that the largest single class of news releases relating to plastics is that which describes new uses and processes for polyolefin films. Use of the word polyolefin itself (rather than polythene) provides a good measure of the quickened activity in this area. A few years ago, high pressure polythene was the only important olefin plastic. Now one speaks of a family of olefins which includes low pressure and high density varieties of polythene as well as polypropylene.

Transparent film has many uses, but the bulk of it goes into packaging. Out of the 700m. lb. film market, 64% is used in this way, and of all products being wrapped in plastic films, foodstuffs are predominant. Thus, the Chase Bag. Co. has announced the production of 2-5lb. sizes of sugar bags from three mil regular polythene. At present, the cost remains higher than that of the familiar stiff paperboard units, but higher volume production should bring a more competitive situation.

Cracker-Cookies and Cigarettes

Linear polythene producers place high hopes on capturing 110m. lb. worth of the cracker-cookie and cigarette wrapper markets in 1961. High density types of linear polythene also find use in industrial bags where the change from multiwall kraft construction gives a 70% saving in weight. Total linear capacity is now at 350m. lb. and this will be doubled in a year or two. The major producers include Allied Chemical, Celanese, Dow, Du Pont, W. R. Grace, Goodrich-Gulf, Hercules Powder, Koppers, Union Carbide, and Phillips.

Take another look at this list. These illustrious corporations are the heart, soul, backbone and very pith of the American plastics industry. It is an eloquent comment on the stature of linear polyolefins.

Most of the foregoing items recount the capture of common uses of cellophane, paper and metal foil by transparent plastic film; there are also completely new and unique uses for plastics in the food packaging market. The most captivating of these is the cooking technique called heat-in-the-bag, in which plastic wrapped frozen food is taken from the freezer and dropped — bag and all — into boiling water. After the requisite heating, the still intact bag is opened and the

Continued on page 1082

US Floating Air Car has a Flexible Polyurethane Skirt

THE operation of this bizarre air car of Curtiss Wright depends strongly on a rather bizarre rubber-polyurethane. The entire base of the car is enclosed by a flexible elastomer skirt which confines the supporting air cushion. The service requirements of this skirt are very severe. As the vehicle moves along a few inches above the ground, the skirt contacts all sorts of abrasive surfaces. Although the original natural rubber skirts soon gave way before the constant tearing, gouging and abrasion the Uscothane polyurethane (US Rubber) appears to last almost indefinitely.

US Rubber recently introduced a series of vulcanized urethane compounds supplied in sheet or rod form. There are a number of standard formulations which cover the usual durometer range for soft elastomers. All are produced from the reaction of diisocyanates with hydroxy terminated polyesters or polyethers, and attain their range of properties from variation in chain extender or curing procedure, rather than variation in the amount and type of fillers and softeners.

In these respects, urethane rubber technology has added a new dimension to the conventional practices of American rubber manufacturers. Here is a unique situation where the empirical rules of compounding are at least partially replaced by the predictable reactions of polymer chemistry. An incautious prophet could easily describe these urethane processes as pivotal in the history of the rubber industry. Perhaps they are, technically; but high material costs will undoubtedly cloud the economic picture for a considerable period yet to come.

There is also, however, a large body of urethane production in the US which more closely follows the usual compounding and processing techniques. There are available at least four solid elastomers (and one liquid urethane) which require only the addition of small amounts of curing agents for processing on conventional rubber machinery. These polymers include Du Pont's *Adiprene C*, an unsaturated polyether urethane cured with sulphur or peroxides; General Tire's *Genthane S*, a peroxide curable polyester urethane; Goodrich's *Estane*, a completely reacted polyester urethane which requires no curing operation; and Goodyear's *Chemigum SL*, a polyester type.

Sold Below Cost

The ubiquitous problem of high material cost is well illustrated by Du Pont's experience with Adiprene. When this elastomer was first introduced some six or seven years ago, the price was set at $1.50 a lb. Although this represented a loss, it was hoped that increased demand in tyres would ultimately justify this figure. Unfortunately, the tyre industry decided that the economic climate was not suitable for a high priced super tyre, and with the loss of this prospect of large sales volume, the price was immediately doubled; today Adiprene C sells at $2.50 a lb. Recent development and sales effort by Du Pont have been centred on the liquid urethane, Adiprene L, at $1.30 a lb.

AMERICAN LETTER

Continued from page 1081

food deposited directly on the diner's plate. The necessity of stirring and pot washing is eliminated, thus bringing the housewife another step closer to complete emancipation.

The pouch itself is made of one of several types of laminated construction. The Du Pont combination of 1/2 mil polyester and 2 mil polythene leads the field in both sales and promotional effort, although about 20% of the 69m. pouches sold in 1959 were made from aluminium foil — polythene or paper-polythene constructions.

Casting Technique

In the area of processing, linear polythene of medium density (0.93-0.94) has lately shown promise of breaching the film packaging market by means of the new casting technique of film formation. This is an extrusion process in which the extruded liquid film is cooled on a chilled roll or in a water bath. Film cast in this way has greater clarity, stiffness and uniformity than the conventional blown film. The importance of stiffness and uniform gauge lies in the increased speeds which cast film allows on overwrapping machinery. In a recent test run on standard wrapping equipment, cast medium density film increased the maximum packaging rate by 50% to an output of 60 packages a minute. At this rate, blown films are subject to intolerable deformation. Such an increase in package production is vitally necessary for cast film to help offset its relatively high manufacturing costs. The current price quoted by Ludlow Plastics is 63 cents per lb. which translates to .0266 cents per sq. in. for 1-1/4 mil film. Comparable figures for 300 MFD cellophane are 62 cents per lb. and .0318 cents per sq. in. This year's production of cast film was 20m. lb.; the production for 1961 is rated at 40m. lb. The most recent of several new casting resins in US Industrial Chemical's Petrothene 218, a low-haze polythene of 0.933 density.

When one reads of such promising non-food application for polyolefin film as typewriter ribbons and power boat tarpaulins, it is not surprising to find new ventures in the production of these resins. Thus Shell Chemical has announced a new polypropylene facility of 80m. lb., with an ultimate capacity of 400m. lb., for 1962. Rexall, the well-known drug firm, have recently consolidated their plastic film operations into one division, with factories at Masonville, R. K.; Chippewa Falls, Wisc.; and Santa Ana, Cal. (How apt an illustration of American origins in these sites!)

New Moulding Techniques

The continuing effort to produce rubber products at higher speeds with fewer personnel has found new impetus in the work of the Molded Rubber Products Corp., of Milford, Connecticut. The president of this new company, Donald F. Spengler, is the inventor of an automatic moulding machine which is being successfully used in two of Connecticut's smaller rubber factories (Bridgeport Fabrics and Jacobs Rubber). The automation starts with the warm-up milling and continues through calendering, blanking, moulding and trimming. Strips of calendered stock at 150°F. contact half the conveyor-mounted mould which cuts the blanks. The second mould half mates with the first just before the closed mould enters the 18ft. vulcanizing section. Plungers eject the cured parts and brushes clean the mould cavities before the endless conveyor returns the 6 x 6in. moulds to the starting point. A speed variation from 6 to 36ft. per minute allows cures of 1/2 to 3 minutes at temperatures of 290°-350°F. Only one operator is required to obtain production rates such as 15,000 soles or 400,000 O-rings per eight hour shift. Base machine cost is $30,000.

Flashless and Trimless

The State of Connecticut was also the scene of the development of the older Gora-Lee process of automatic moulding. The Ohio Rubber Co. plant at Stratford has been producing O-rings, seals, and larger parts for several years by this method, which is in many respects similar to that of Mr Spengler.

Another advance in moulding technique comes from US Rubber's new 'flashless and trimless' moulding method. Dr Herbert Jurgeleit has obtained US Patent 2,883,704 covering what is essentially a variation of the transfer process.

The major innovation in the patent involves securing the transfer piston and cylinder to the upper platen of the press. This design is quite reminiscent of several that appeared in F. Skelton's interesting article on 'The Mechanical Handling of Moulds' in several *RJIP* issues of June 1952.

US Rubber has evolved an elaborate licensing system for those who desire to produce moulded goods by their flashless and trimless process. The licensing agreement involves (1) the provision by US of a technical manual which sets forth the principles of the process, together with the consulting services of the inventor on a $200 per diem basis (2) complete concealment of process details, and (3) a royalty payment equal to 3% of the net selling price of parts made by this technique.

The French Oil Mill Machinery Co., of Piqua, Ohio, have been active in supplying presses conforming to the requirements of the process.

Rubber Takes Over

The Thai Finance Minister, Sunthorn Hongladarom, said in Bangkok that for the first time Thailand's rubber exports had exceeded her rice exports in value.

The Minister called this a very important and new economic trend. So far, rice has been considered the mainstay of Thailand's economy.

He revealed that during the first 11 months of the current year, Thailand's rubber exports were worth 2,384m. ticals, compared with 2,350m. ticals for rice (60 ticals= £1).

What is said to be one of the largest zinc electro-deposition plants ever made has been completed for a French steel manufacturer by the Electro-Chemical Engineering Co. On the top of each tank is a slotted tray made from BX Plastics' Cobex rigid vinyl

Unique idea becomes successful product with PLIOLITE LATEX

Unique in concept and construction is the best way to describe the handsome floor covering pictured above. The idea is to use it first as temporary carpeting, later as permanent padding under conventional carpeting. It's made of colourful, durable open-weave cotton, permanently bonded to long-lasting foam rubber. The price—surprisingly low!

A vital part in turning this bright idea into a successful product was played by PLIOLITE LATEX 5352. This new styrene/butadiene rubber latex was chosen primarily because it can be used *without* blending with natural rubber latex to make resilient, durable foam. Other reasons for its selection: Outstanding uniformity. Excellent physical properties.

How can Pliolite Latex 5352 help you put your product out in front? You'll find it makes an excellent, economical cushioning for *many* products. For details see your Goodyear Chemical Distributor.

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VIEWS and REVIEWS

THE 'Dunlop Gazette' continues on its lively way under the able editorship of M. W. Wilson. The November 1960 issue makes a special feature of the Dunlop plantations because 1960 was the jubilee year of Dunlop Malayan Estates Ltd. From a humble start in 1910 (when the price of Brazilian rubber was 12s. 10d. per lb.) the enterprise developed by dint of effort and large capital expenditure so that, by the early twenties, the output had risen to several million pounds of dry rubber annually.

Huge Plantation Enterprise

'Today, Dunlop Malayan Estates Ltd. is a huge enterprise in its own right comprising twelve rubber estates in the States of Negri Sembilan, Malacca, and Johore in the southern part of Malaya. Their total area is 75,000 acres, or roughly the size of the County of London. This total is the more impressive if one remembers that the latex is collected, drop by drop, in cups little bigger than a tea cup from countless thousands of trees, each one of which has to be carefully raised from a seedling and tended throughout its life.

'The greater proportion of the crop is today processed into concentrated liquid latex by three main estate factories and is shipped to destinations all over the world from Dunlop's own bulk installation at the port of Singapore, with an operating capacity of over one million gallons.'

The sheet rubber consumed by Dunlop is not produced on Dunlop estates but bought outside, though the new Nigerian plantations of the company will produce sheet rubber.

Dunlop's Private Army

Under the title of '50 Years of Growing Rubber,' the history of the Dunlop plantation estates project is well told, with special attention to the difficulties of the war years when Malaya was occupied by Japanese forces and the estates neglected, and to the terrorist campaign just after the war when Dunlop had its own private 'army.'

The article also stresses the large-scale human problems facing the estates' management. 'There were no ready-made towns, no housing, no amenities of any kind; in fact, nowhere for employees to live. The estates had to create not only their 75,000 acres of rubber estates but the houses, schools, medical services, places of worship, social and entertainment centres — in fact, everything necessary to the life of a resident population of 20,000 employees and dependants.'

Looking to the future, the article discusses the Dunlop policy of staff training for young Malayans into whose hands the job of rubber planting will gradually pass. The article concludes with a short glance at the contributions made by technologists.

'Dunlop became the first company in Malaya to use bud grafting on a large scale and how successful it has been may be judged from the fact that by 1935 on some 35,000 acres of grafted trees annual yields rose to 1,000lb. or more per acre compared with a previous 300 to 400lb.' Of course, this figure of 1,000lb. has now been exceeded, as recorded elsewhere in this issue of the 'Dunlop Gazette,' and 2,000lb. will soon be a normal figure.

The article is well written and well illustrated, and raises the thought that there is in the company talent enough to write the complete history of the Dunlop plantations, interesting enough to warrant general publication. It should be done soon, while memories are green enough and records still exist.

The Organization Man

As is to be expected, most of the contents of the 'Dunlop Gazette' is concerned with news of people belonging to the Dunlop Company, in its world-wide organization. Do you notice that word 'belonging'? Doubtless it is one of the aims of all house magazines like this to foster that sense of 'belongingness,' of strong, company-loyalty.

Not a bad thing in itself, you may think, and may reflect that most of us, as the years of our service to an organization extend, become emotionally attached to our employing firm, however large or small. That, and many alleged consequences, is the theme and content of *The Organization Man* by William H. Whyte, recently published as a Penguin book at 3s. 6d. and originally published in New York in 1956. Let me summarize the first of its 29 chapters by means of a string of quotations from it.

'This book is about the organization man . . . not the workers . . . nor the white-collar people, who only work for The Organization. The ones I am talking about *belong* to it as well. They are the ones of our middle class who have left home, spiritually as well as physically, to take the vows of organization life. . . .'

'The corporation man is the most conspicuous example (of) the collectivization (which) has affected almost every field of work.' '. . . they are keenly aware of how much more deeply beholden they are to organization than were their elders. They are wry about it, to be sure; they talk of the "treadmill," the "rat race," of the inability to control one's direction. But they have no great sense of plight; between themselves and organization they believe they see an ultimate harmony. . . .'

'The organization man seeks a redefinition of his place on earth . . . something that will do for him what the Protestant Ethic did once. And slowly, almost imperceptibly, a body of thought has been coalescing that does that. I am going to call it a Social Ethic. With reason it could be called an organization ethic, or a bureaucratic ethic: more than anything else it rationalizes the organization's demands for fealty and gives those who offer it wholeheartedly a sense of dedication. . . .'

'By Social Ethic I mean that contemporary body of thought which makes morally legitimate the pressures of society against the individual. Its major propositions are three: a belief in the group as the source of creativity; a belief in "belongingness" as the ultimate need of the individual; and a belief in the application of science to achieve the belongingness.'

'I am going to argue that he should fight the organization. But not self-destructively.' 'We do need to know how to co-operate with The Organization but, more than ever, so do we need to know how to resist it.' 'The fault is not in organization . . . it is in our worship of it.'

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **F. C. JENNINGS**

Fighting a Feather Bed

I think that fairly represents the main argument of chapter 1 and, indeed, the theme of the whole book. It also gives something of the flavour of the writing, which I confess I found difficult to read at times — like fighting a feather bed, it was so voluminous. The words I have quoted above are only 7% of the words which make up the first chapter and in the whole book there are 500 times as many. (It is good value for money — well over 4,000 words per penny.)

It deals with an important matter. I think it proves too much. Almost all our ills, it would seem, spring from our love of the organization we work for. That love the author follows into the many and obscure corners of (American) life; into the cities, towns, townlets, suburbias which it creates; into the families, friendships, females, feuds, finance, and fiction it forms; the churches, chapels, and colleges; the leisure leading to loneliness under the spell of love of the organization. The 'blurb' says we must take warning from this book; I wish I knew what it was warning us against.

'There is a pleasure sure
In being mad, which none but madmen know,'

said Dryden, long before these ideas were promulgated, and perhaps that is why I am not impressed by William H. Whyte's arguments.

More Plasticity and Less Elasticity

What does impress me in the life I lead now is the readiness with which 'organization men' throw off the bonds of the organization when they come to retire; it is not that they forget it or lose interest in it, it is that it falls into perspective. I am convinced that there would be much better organizations and much better and happier servants of organizations if such a perspective could be attained during working life, if dedication to and absorption in the job could be seen as the vice it really is. I strongly suspect that what the modern industrialist wants is less elasticity and more plasticity, more hysteresis and less resilience.

Olefin Copolymers

There are several good reasons why the paper by Natta and Crespi on the Rebound Elasticity of Polymers and Copolymers of alpha-Olefins appearing in *Revue Generale du Caoutchouc* for July-August 1960 (Vol. 37, No. 7-8, pp. 1003-7) should be noticed here. It concerns materials of great interest to polymer technologists, it characterizes them by means of dynamic tests, it is authoritative, and it is clearly, simply, and logically written. The results lead to useful theoretical conclusions and suggest a way of getting round the problem of measuring the elasticity of high polymers most of which are not amenable to the classical theory of elasticity because they have a visco-elastic component, having properties intermediate between a rubber and a plastic.

'Rebound elasticity, that is to say the capacity for storing and returning energy during short intervals of time, is one of the properties of elastomers most interesting from the practical point of view. . . . Among the many elastomers and related synthetics few possess elastic properties which remain constant throughout a wide range of temperature including ordinary temperature.

'All the polymers of alpha-olefins and hydrocarbons of the vinylidene type have low rebound elasticities because of the rotational interference of the side-chains or lateral groups which reduce the flexibility of the main chain. Linear polyethylene has a very flexible main chain but, owing to its high crystallinity, it does not behave as an elastomer, except at temperatures above its melting point (137-8°C. for perfectly linear polyethylene of high molecular weight).'

Ethylene Propylene Copolymers

Earlier work has shown that, of all the polyhydrocarbons, the linear copolymers of ethylene-propylene have an especial interest because the presence of the ethylene not only improves the elastic properties at normal temperature but also lowers the glass temperature.

'The atactic poly-alpha-olefins made by anionic polymerization and co-ordination resemble, at normal temperatures, amorphous, rubbery but non-vulcanized polymers. The second order transition temperatures of these polymers is lower than those of polypropylene and polyhexene. The rebound elasticity of these polymers at ordinary temperature is not very high and, like other elastomers, when the temperature is lowered the rebound elasticity is reduced until it reaches a very low value. . . . Below a certain temperature (in general closely related to the second order transition temperature) the rigidity of the macromolecular chain is so strong that the phenomenon of visco-elasticity disappears and energy restitution becomes elastic.'

A graph gives three curves, for polypropylene, polybutene, and polyhexene, relating rebound elasticity (ranging from 0 to 70%) and temperature (from −50°C. to +20°C.). Each of the three curves passes through a minimum at a value only just above zero for rebound elasticity.

	Temperature of min. rebound elasticity	Second order transition temperature
Polypropylene	+ 3°C	−35°C
Polybutene	− 3°C	−45°C
Polyhexene	− 22°C	−50°C

For a copolymer of approximately equal parts of propylene and butene, a similar curve gives a minimum rebound elasticity temperature of about 0°C., intermediate between the values for polypropylene and polybutene, as shown in the above table.

Rebound Elasticity Higher

'By copolymerizing ethylene with alpha-olefins, linear copolymers are produced, essentially saturated and amorphous, and with good elastic properties. Their dynamic characteristics when vulcanized are particularly interesting. The rebound elasticity of these copolymers is much higher than that of other saturated and amorphous hydrocarbons, *e.g.* atactic polypropylene, polyisobutylene, etc.'

'In the ethylene-propylene copolymers where the monomers are distributed at random along the chain, the most flexible parts of the macromolecule are formed by the methylene groups, while the propylene are the least flexbile. The flexibility of the macromolecular chains increase in proportion to the increase in ethylene content.' A curve demonstrates this and equations are derived representing these relationships for copolymers of ethylene-propylene and ethylene-butylene.

The results of studies on copolymers with only small proportions of one monomer are interesting and these are followed by comparisons between the rebound elasticity curves for mixtures and for copolymers of the same composition, in which striking differences occur.

CHARLES JENNINGS

MEN *and* MATTERS

A Review of People and Events

by Peter Richards

HEART disease is the number one killer. So any news of medical developments in the fight against it is very good news indeed.

Work is already well under way on a variety of methods of replacing parts of the heart, and a recent paper from Goodyear (US) reports progress on perfecting a low-cost technique for fashioning both rubber heart valves and the plastics moulds from which they are made.

An effective valve designed to be sewn into the human heart has a list of specifications as long as all the arteries and veins put together. This includes long fatigue life, compatability with human tissue, resistance to chemical deterioration by the blood they must pump through the body, resistance to the blood's natural tendency to clot when it encounters a foreign object, and reasonable ease in making valves.

Tissues Similar to Rubber

Among various approaches, rubber has been nominated by many researchers as the material to do the job, inasmuch as heart tissues, arteries and veins are physically more like rubber than any other non-living structural material.

Goodyear's research men feel that a cast, cured urethane rubber has promise of filling the requirements better than most others.

Natural valves, which the artificial ones must replace, are extremely thin, two- and three-petalled regulators which open like the petals of a flower when the heart squeezes, and relax to a closed position when the pressure abates. Located at the inlets of the heart chambers, the function of the four valves in the heart is to regulate the flow of blood to the chambers and the arterial-venous system.

The need for rapid advancement of experimental work to combat heart and cardiovascular defects requires that moulds should be capable of quick, easy design variation and adaption by the medical researchers themselves, rather than by more time-consuming mould making processors.

The basic techniques worked out by Goodyear for making both moulds and heart valves can be applied to making valves of widely varied design, to other portions of the heart, including whole artificial hearts, and to other parts of the cardio-vascular system. In fact the day is coming closer when a patient will leave hospital with a complete artificial heart replacing his defective one.

Osborn Appointments

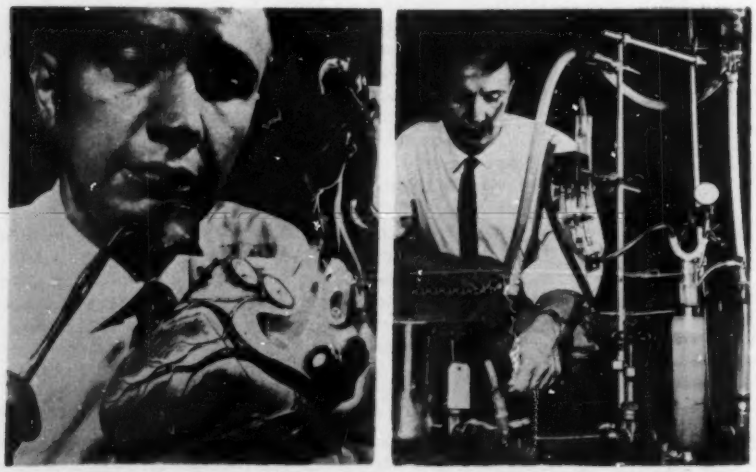
As a result of the G. H. Osborn Building Products Ltd. expansion programme, J. A. de B. Hallows has been appointed sales manager of the newly formed industrial division. He has been with the company for a year assessing, programming and initiating the sales of reinforced plastics products as a preliminary to launching his division.

J. de HALLOWS R. BECHERVAISE

Mr Hallows was with Resinoid and Mica Products Ltd. for some years. Prior to joining Osborns he was general sales manager for Lacrinoid Products Ltd.

Another appointment at Osborns is R. J. Bechervaise, who has been made pre-production manager. His department will deal with estimating, tool design and establishing preliminary methods of processing.

Mr Bechervaise has been in the plastics industry since 1937. He was for some years technical manager of Resinoid and Mica Products Ltd., and, before joining Osborns, was technical manager for Ranton and Co. Ltd.



Checking a delicately moulded rubber valve designed to be sewn into the human heart (*left*). Two of the heart's three petalled valves can be seen at the top of the model. On the right is a pumping apparatus duplicating the action of the human heart. (*See first story*)

Plasticast and Combex

E. G. Clarke and B. L. Rogers have been appointed to the board of Plasticast Developments Ltd., of Savile Row, London, and Peterborough — a member of the Dunbee group. Combex Ltd., toy manufacturers in the group, have appointed Miss P. Skates-Graham and B. Collings to their board.

Mr Clarke, 32, has been in the plastics industry for 16 years and is a DPI. He has been associated with the company for 11 years as manager of Combex Ltd. Mr Rogers, 40, with the company 14 years, will now be responsible for production, sales liaison and administration of the Peterborough sales office.

Creating Space

Space is often a vital commodity today. A new type bunk for sub-

marines that disappears as easily as a hideaway bed, leaving much-needed space for crew recreation, has been delivered to a number of ships of the US Navy.

The bunk is versatile because it is air inflated. Made of Airmat, a Goodyear rubberized fabric and air sandwich, it can be simply and quickly deflated, and folded against the wall to make space and re-inflated just as effortlessly for sleeping.

An equally important feature of the new bunks, from a crew standpoint, is that they will afford greater sleeping comfort since their air pressure can be adjusted to whatever 'hardness' or 'softness' the sleeper likes!

Corrosion Problem

Polyolefin film seems to be wrapping most of the world's products these days. The other day I came across a rather out of the way application which keeps out moisture and humidity in the shipping of coiled wire.

A new packaging method became imperative for a wire manufacturer when corrosion of coiled tyre bead wire kept customers from building inventories, creating added storage and production-line delays for the company.

In the new method a pair of wire coils is set inside a polythene bag. A dessicant is then inserted, air withdrawn, and the bag sealed. Cardboard wrappers go on next, and the coils are steel-strapped to a pallet. The packaging was tested by immersing it in a high-humidity test chamber. After six weeks immersion the wire showed no signs of rust.

Bush, Beach & Segner Bayley Ltd., suppliers of plasticisers, carbon black and other industrial chemicals, recently gave gold watches to six employees who have been with the firm for 25 years. Presentations were also made to four directors—J. F. A. Segner, W. C. Wiggins, W. E. Powell and S. Farrow—whose individual service as director and employee exceeds 25 years. (*Left to right*) **W. C. Wiggins and J. F. A. Segner, D. A. Gates (chairman and managing director of Bush Beach) and E. E. Phillips**

New Old Timers

At a special dinner held at Bakelite's Tyseley factory, the managing director, G. W. Hodds, welcomed as new members to the 'Old Timers' Association' 44 employees who during the present year have completed 25 years of service with the company.

In all the company now has 264 employees who have completed 25 years of service. During the course of the year commemoration gold watches have been presented to the 44 'new' Old Timers. The company hopes to have the opportunity of presenting 45 commemoration watches during the coming year.

Patrick Moxey

A well-known figure in the plastics world has been appointed editor of *Chemical Products*.

He is Patrick Moxey who was Press officer for Bakelite and more recently was responsible at Distillers plastics group for the publicizing of high density polythene.

Mr Moxey commenced his career shortly before the war as a mining chemist, served with the RAF in SEAC and afterwards resumed his career as a foodstuffs chemist before turning to journalism.

Question Corner — 150

(Second Series)

475. What are the advantages gained by coating flexible materials such as paper with polythene?

(Answer next week)

Answer to Question Corner — 149

474. The methods for coating aluminium foil and Cellophane are similar to those used for coating paper, but they are made more difficult by the non-porous nature, and smoothness, of these materials. This tends to reduce the strength of the adhesion.

Polythene is coated on to aluminium foil mainly to make the foil heat sealable, to improve the puncture resistance and the flexibility at low temperatures.

Annealed aluminium foil is generally used and the coating is done at lower speeds than paper coating and high melt extrusion temperatures are used. It is generally considered desirable to wash and pre-heat the foil so as to remove oil and surface moisture. Both these treatments improve the adhesion of the polythene.

Cellophane is coated with polythene because the resulting laminate combines the flexibility, toughness and moisture resistance of the polythene with the clarity, low oxygen permeability, grease resistance and good printability of the Cellophane. Polythene coated Cellophane may be made for the manufacture of containers for liquids, especially in food packaging.

(Another question next week)

Polly Ester Says . . .

'Calendered sheet—you should see the one I posed for this year'

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IRSG Secretary-General Retires

A. G. PAWSON SUCCEEDED BY P. F. ADAMS

A. G. PAWSON, Secretary-General of the International Rubber Study Group retires today (Saturday December 31). His successor is P. F. Adams, who is already well known internationally in the rubber industry, and who attended

A. G. PAWSON

the recent meeting of the Group in Kuala Lumpur. Mr Adams was in the service of the Malayan Government from 1953 to 1959, his last appointment being secretary for the ministry of commerce and industry.

Mr Pawson has been connected with the rubber industry for 26 years. His long association began when, while serving in the Sudan as governor of the Upper Nile Province, he was selected as secretary of the International Rubber Regulation Committee. This committee was finally wound up in May 1944, and a few months later the International Rubber Study Group was formed by the Netherlands, the UK and USA. France joined in 1954.

In Paris, in July 1947, the Group was thrown open to all countries and from that point it had a management committee, and only one Secretariat situated in London; Mr Pawson became secretary of both these bodies. (Until 1947 he was secretary of the London Secretariat which worked for France, Netherlands and the UK; at that time USA had its own Secretariat in Washington.)

Sir John Hay, who coined the words 'Study Group' in 1944, said they were intended to emphasize the fact that the Group had no regulatory functions and was designed only for taking the heat out of international rubber problems by discussion and friendly examination. (Later the Group took powers of joint recommendation, but still without any powers of enforcement.) With Mr Pawson as Secretary-General the Group has performed this function admirably, being responsible for disseminating much valuable information and promoting good international relations throughout the rubber world.

A. G. Pawson, who was educated at Winchester and Christ Church, Oxford, joined the Sudan political service in 1911. He is an Oxford cricket blue and was captain in 1910 — he and his son (Tony Pawson, the Kent cricketer) are the only father and son who have both been captain of the Oxford cricket eleven.

CEYLON RUBBER AGREEMENTS

Ceylon will supply 28,000 tons of rubber to China in 1961, in exchange for 230,000 tons of rice. This is said to be the substance of an agreement signed between the two countries in Colombo.

This represents a big increase over the current agreement, which is believed to involve 18,000 tons of rubber.

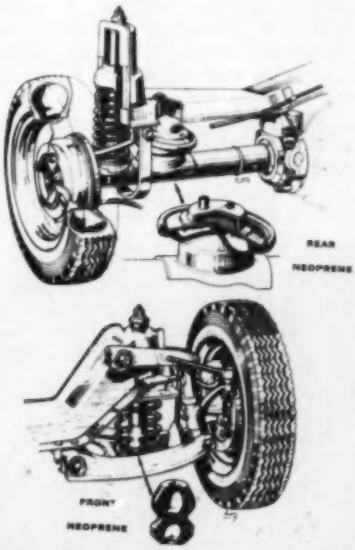
Ceylon has also made a trade agreement with the United Arab Republic for 'the development of trade between the two countries.' This agreement, which is to be signed in the second half of January, provides for Ceylon to export products including rubber in exchange for UAR goods.

Renault's Aerostable Suspension

USES NEOPRENE AIR CUSHION

IT is traditional for cars to have leaf spring suspension which, although effective up to a point, can be too hard for comfort when there is only one person in the car. Rubber suspension, on the other hand, can be insufficient for a full load of passengers. The aerostable system recently introduced by Renault incorporates the advantages of both of these methods with a neoprene air cushion and steel springs. As a result, when the load of the car increases the springs take up the additional weight, making for a comfortable ride however many passengers there may be.

Research and development of the aerostable system took more than four years before a suitable material for the air cushion was tested and approved by Renault. The specification called for an elastomeric material having good ageing properties, perfect air retention, resistance to oil splashes and salt contamination from icy roads, high abrasion resistance and good flexing properties, and eventually neoprene was chosen.



Front and rear suspension units of the Renault Dauphine, showing the position of neoprene air cushions

From Arctic to Sahara

For four years the aerostable system incorporating the neoprene air cushion was tested by Renault engineers in the field. Test cars were driven in the arctic regions of Canada and Norway, in the highly abrasive conditions of the Sahara desert and in humid, tropical French Guinea. 'During this period,' said Mr P. d'Arrivere, an executive in Renault's materials testing and research department, 'we did not experience one breakage or cracking of the neoprene air cushions.'

It is said that this cushion will last the life of the car and needs no maintenance.

Mr Henry Kremer is relinquishing his executive appointments in the Microcell group of companies in order to devote more time to the parent BTR Industries, of which he is a director.

Latex Cuts Packaging Costs

BY coating one side of a recently introduced resilient packaging material—called Carbion—with a latex solution, a new system of packing has been developed.

Carbion itself consists of a straw-paper or similar base passed through heated profiled pressure rolls which impart a characteristic double-wave pattern to it. The pattern is resilient, and the material is already widely used for case lining, as cushioning between layers, and for general protective-cushion-packing.

The addition of a latex coating in many cases eliminates the need for other means of fastening. Standard commercial latex is used, which is applied by rollers, after which the material is force-dried, cooled and reeled. This special process has been developed by Spicers Ltd., of Loughton, Essex, who also make and market the material.

Self-Adhesive Coating

The main application is the protection of small parts. Much time and labour is often spent on packing spare parts, accessories, small tools and similar items. These are now merely placed on a piece of Self-adhesive Carbion of appropriate size (first picture), the piece is folded over and firmly pressed down along the edges and around the enclosed parts which are immediately held securely in an envelope of convenient shape (second picture). To remove the parts, the seal is pulled apart. The material can be used several times. The latex does not adhere to any surface, unless it also has a coating of latex.

Larger parts can be packed by placing them between two separate sheets of the material, while irregularly shaped items are protected by folding the material over them and pinching the folds so formed together. Tubular products, furniture legs and similar items, which have hitherto required the use of time-wasting spiral wrapping with tapes, can now be protected better in a fraction of the time formerly required.

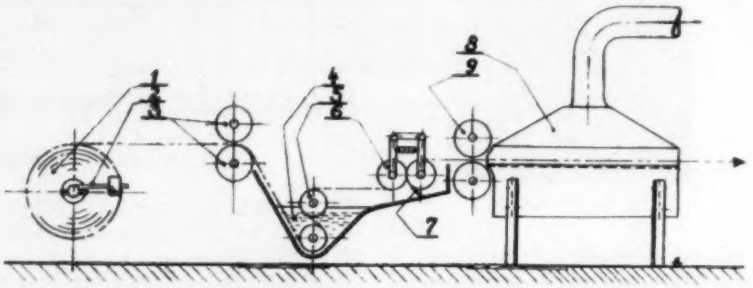
ASTM Committee Week

Thirty of the Society's 85 main technical committees have scheduled meetings at the ASTM Committee Week meeting in Cincinatti, USA, from January 30-February 3 1961.

Committees meeting include D-11 on rubber and rubber-like materials and E-17 on skid resistance.

Impregnating Glass Fabrics

A DETERMINANT factor in the quality of glass-fibre reinforced polyester products is preliminary impregnation with suitable resins. For efficient production, the impregnation process should be carried out on a continuous flow basis. Also, the impregnated glass fabrics should be readily stackable. Such a process has been described by the European Productivity Agency, and detailed information is available from: Anwendungstechnische Abteilung der Reichhold Chemie A.G., Hamburg, Germany.



The figure shows a continuous impregnation plant. In the sketch, 1 is the roll of untreated glass fibre, 2 the braked friction bearing, 3 guide rollers, 4 impregnating bath, 5 impregnating rollers, 6 squeeze rollers, 7 stripper, 8 drying tunnel, 9 conveying rollers.

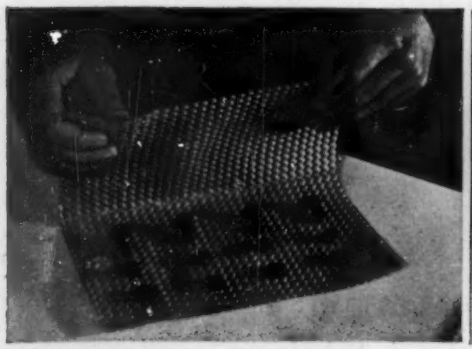
The solvent of the impregnating resins (generally acetone), is evaporated in the drying tunnel by means of air heated to a temperature of 70° to 80°C. The impregnated fabrics emerge fully dried, but still retaining the full capacity for reacting with the polyester resins in the succeeding final shaping process, involving hot pressing at temperatures of 100° to 150°C.

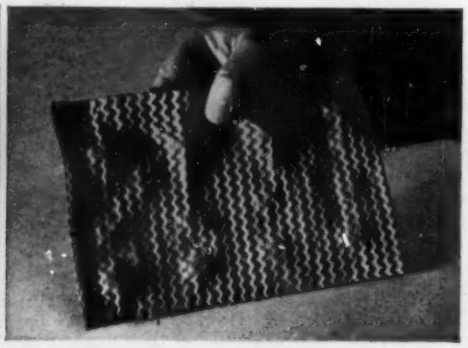
Within this temperature range, the three-dimensional intermeshing between glass fibres, pre-compounding resins and polyester resins yields optimum values without causing brittleness.

The process is applicable to the economical production of large-surface shaped parts.

Extrusion Coating

A black pigmented polythene resin for extrusion coating paper, paperboard, or aluminium foil has been introduced by US Industrial Chemicals. Called Petrothene 201-220, this resin, with a 0.916 density and 4.0 to 5.5 melt index, is expected to find application in automobile door liners, agricultural mulch-coated paper and packages for photographic film or paper.





Small parts are placed on a piece of self-adhesive Carbion of the required size (*left*), **which is then folded over on itself.** (*Right*) **Where the latex coating on the inner surfaces touches around the enclosed parts, a firm bond is immediately formed and retains the parts securely**

Canada's Outlook Favourable

CANADIAN rubber industry officials in end of the year comments on 1960 results and 1961 outlook consider the outlook generally favourable.

T. M. Mayberry, president of Firestone of Canada, said: 'The Canadian economy appears to be in a period of adjustment with a somewhat slower rate of growth apparent for the immediate future. Already, however, there are indications that the business tempo will pick up later next year, although we cannot expect to witness the same spectacular gains to which we have become accustomed.

'In the tyre industry, increased costs of materials, high taxation levels and competitive conditions will probably continue.

'Nevertheless, the outlook is generally favourable. While new car and truck production may not reflect any gains, the tyre replacement market is encouraging as the total number of motor vehicles on Canadian streets and highways continues to increase.'

E. R. Rowsee, president and managing director, Polymer Corp., said: 'The recent meeting of the Canadian Trade Service in Ottawa has emphasized that we are, and must continue to be, a trading nation. Competing successfully at home and abroad will require a positive co-operative approach by the principal elements of our economy, and aggressiveness in research and technology to increase our efficiency and service. We must go after markets and sell what we have to offer.

'In the course of my recent trip to Europe with the Canadian trade mission, I was impressed with the progress made by the European Common Market countries, and the challenge to Canada arising from these developments.

'Total world consumption of new rubber in 1960 will reach a new high. This is particularly true in the case of synthetic rubber where the annual requirements continue to grow. Increased synthetic rubber capacity will become available during 1961.

'We are confident that the growing demand for synthetic rubber, together with a continuation of Polymer's policy of vigorous development in Canada and abroad, will give us another year of full capacity operation at a somewhat higher level than that which prevailed in 1960.'

Canada's 1960 Position in Figures

Rubber

According to advance figures compiled by the Industry and Merchandising Division of the Dominion Bureau of Statistics, the value of factory shipments from the 89 establishments engaged in Canada primarily in the production of rubber products during 1959 were valued substantially higher than in the corresponding period of last year.

The preliminary report indicates that the 89 establishments, unchanged from previous year, during 1959 made factory shipments valued at $347.6m. an increase of 12.7% from 1958 total of $306.3m.

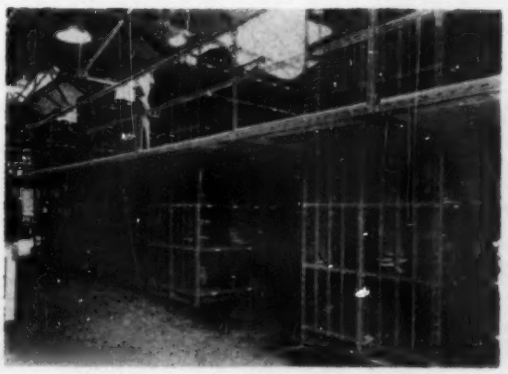
The number of employees increased to 21,093 from 19,943 year before, while salaries and wages amounted to $86.8m. compared to $76.4m. Cost of materials and supplies amounted to $160.4m. compared to $128.6m.

Plastics

Shipments from the Canadian primary plastics industry during 1959 were valued at $103.5m., an increase of 5.9% over the previous year's total of $97.8m., according to a preliminary compilation by the Dominion Bureau of Statistics.

The number of establishments was unchanged from the preceding year at 34, while the number of employees rose to 3,469 from 3,435. Salaries and wages amounted to $17m. from $16m., and the cost of materials and supplies amounted to $57.8m. compared to $52m.

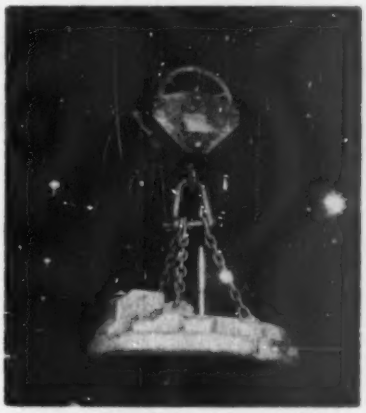
Polythene mulch film has increased test vegetable yields as much as 100%, claims a US Industrial Chemicals agronomist.



A slotted angle installation designed by Dexion has doubled the capacity of a storage bay at the Lincoln plant of James Dawson and Son, manufacturers of transmission beltings. A cantilevered 'walkway' on the upper tier gives easy access to belts stored there

PVC/NITRILE CABLE BLEND

Cables clad in a new sheathing material made from a blend of Geon PVC and Hycar nitrile rubber are now being produced by Greengate and Irwell. This 'Niplas' sheathing has been used on trailing cables, welding cables and flexible power cables, such as for supplying power to the magnets of steel handling cranes.



The new cables have been standing up to particularly heavy duty in the scrap metal shed of John Summers and Sons Ltd.

Number of Advantages

With suitable forms of insulation, this cable is claimed to show a number of advantages over other conventionally sheathed types. The nitrile based sheathing withstands temperatures up to 85°C. and has good mechanical properties, good oil, solvent and fire resistance and excellent abrasion resistance — important for welding and trailing cables.

The British Exporter

A second edition of the coloured wall map, 'Information for the British Exporter,' has been prepared for the Board of Trade by the Central Office of Information.

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Rubber Statistics

UNITED STATES—UNITED KINGDOM—MALAYA—SINGAPORE

THE US rubber industry registered a number of new consumption and production records in 1960 despite a slight decline from 1959 in overall manufacturing activity, measured in terms of total new rubber consumption, according to Ross R. Ormsby, president of the Rubber Manufacturers' Association.

On the basis of the association's preliminary estimates, Mr Ormsby predicted these new records for 1960 (previous records in brackets): US production of synthetic 1,450,000 tons (1,379,652 in 1959); consumption of synthetic 1,077,000 tons (1,072,726 in 1959) and exports of synthetic rubber 350,000 tons (290,468 in 1959).

Ratio of synthetic to total new rubber used in 1960 is put at 69% (65.9% in 1959).

The RMA executive said the US consumed 483,000 tons of natural in 1960 compared with 555,044 in 1959. Total new rubber consumed in 1960 amounted to 1,560,000, against 1,627,770 in 1959.

For 1961, Mr Ormsby predicted total new rubber consumption at 1,600,000 tons comprising 1,150,000 of synthetic and 450,000 of natural rubber.

United Kingdom

UK consumption of natural rubber in October of 14,218 long tons compared with 16,681 tons in September, according to the International Rubber Study Group.

UK imports of natural rubber excluding deliveries from the Government stockpile amounted to 11,572 long tons compared with imports of natural rubber in September of 10,713 long tons, including deliveries from the stockpile. UK re-exports in October reached 6,080 long tons of natural rubber against 10,388 in September.

Stocks of natural rubber held by manufacturers and in warehouses at the end of October totalled 25,871 long tons exclusive of Government stocks against 27,667 long tons at the end of September.

Malaya

Shipments of sheet and crepe rubber from Malaya in November totalled 86,291 tons, compared with 77,070 in October and with 97,034 in November last year.

Of the November shipments, the UK took 9,992 tons, USA 7,779 tons, West Germany 5,430 tons, other European countries 23,219 tons, Japan 5,393 tons, the USSR 20,725 tons, Commonwealth countries 7,312 tons, and other countries 6,441 tons.

Shipments of latex and Revertex totalled 7,533 tons in November, against 9,183 tons in October and 12,435 tons in November last year. Last month's figures were: UK 1,534 tons, US 1,880 tons, West Germany 872 tons, other European countries 1,517 tons, Japan 703 tons, Commonwealth countries 456 tons, and other countries 571 tons.

Singapore

Stocks of all grades of rubber in Singapore at the end of November totalled 51,730 tons compared with 60,345 tons at the end of October.

The November stocks in dealers hands were 39,905 tons, in port 8,140 tons, in estates 39 tons, and stocks on trans-shipment from non-Malayan ports were 3,646 tons.

GRP Coach Seat

An integrally designed pair of coach-seat frames constructed entirely in glass-fibre reinforced polyester, is the latest product of the plastics division of Dansk Automobil Byggeri A/S., of Silkeborg, Denmark, an associate of Leyland Motors Ltd. The seat — at 20lb. — is 25% lighter than DAB's conventional tubular steel frame design, yet has the same degree of strength and rigidity.

The seats are of solid construction, and the upholstery is simply bonded to the framework.

At the present time DAB are producing half-cabs in GRP for the latest Leyland Comet goods models. These utilize the standard Leyland metal front pressing and floor superimposed on the glass-fibre cab body, which is independent even of a metal subframe.

Book Reviews

FBI REGISTER OF BRITISH MANUFACTURERS—1961. 33rd Edition. Published November 1960, for the Federation of British Industries by Kelly's Directories Ltd. and Iliffe and Sons Ltd. Price 50s. Size 9¼in. x 7¼in. 1,162 pages.

The FBI Register, guide to a substantial cross-section of British industry, contains lists of the products and services of nearly 8,000 member firms under more than 5,400 alphabetical headings.

In addition to the Classified Buyers' Guide there are seven other sections in the register, giving addresses of companies and firms, and valuable information about trade associations, proprietary names, trade marks, etc. The French, German and Spanish glossaries give translations of every product term used in the main buyers' guide, each being numbered for easy reference between the English headings and their translations.

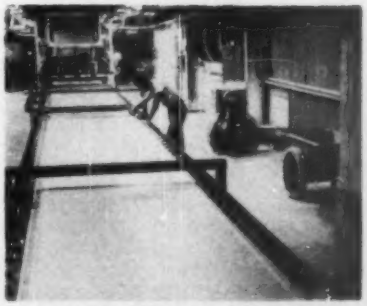
The FBI Register is compiled by the publishers in close collaboration with the Federation of British Industries. It is useful to importers, buyers, Trade Commissioners, Chambers of Commerce, Commercial Attaches, reference libraries, Departments of Trade and Industry, throughout the world.

SOVIET TECHNOLOGY DIGEST.—(Pergamon Press Ltd.) A new monthly digest, approximately 100 pages per issue. Annual subscription rate £10.

This digest of summaries of translations of published Russian papers should prove of interest to those in the English-speaking world concerned with technological advances behind the iron curtain. Summaries of 200 words or more are given of selected articles from a formidable list of periodical and non-periodical publications. The full contents of these publications are also listed and full translations of any article appearing in the digest will be prepared on request and posted within four weeks, or sooner, of receiving an order. The maximum charge for this service will be 70s. per page and this will be reduced if the demand for any one paper is large.

The contents are divided into four broad sections which are as follows: design and production; metallurgy, welding and foundry production; instruments and automation; and general. Included in this general section are book reviews, book news and a list of recent periodicals and their contents which may be abstracted in the future. This is a praiseworthy attempt to disseminate knowledge, and the wide range of subjects covered should make the journal of interest to a large number of industrial and research technologists.

∴ Copies may be ordered through the Books Department, RUBBER JOURNAL AND INTERNATIONAL PLASTICS, Maclaren House, 131 Great Suffolk Street, London, S.E.1.



An engineer inspects a ribbon of gypsum board as it is rolled out on to a specially designed Goodyear conveyor belt at US Gypsum's Shoals, Indiana, plant. The conveyor belt actually serves as a mould for the gypsum board as it carries the continuous strip to the cutting area

Plantation Share Survey

NATURAL versus synthetic. This is the real reason that lies behind those big yields that rubber shares offer in the stock market today. Investors new to the game of becoming a capitalist by way of the Stock Exchange sometimes find it hard to understand why they can only get a return of around £4 on top class industrial equities — the 'blue chips' of the investment world — as against anything usually well over 10% on plantation shares. They are always asking what risks lie behind this kind of attractive yield. The answer, of course, lies in our very first sentence. For the argument runs that synthetic with its stable prices and ability to be tailor-made for different purposes will slowly drive the natural variety off the market. Only those who travel through life with blinkers on would deny that there is no truth in this. Assured supplies of rubber and a stable price are attractions which no maker in this field of industry can overlook.

On the other side, however, there are signs that the rubber planters are making great efforts to remain competitive and new tapping and processing techniques have been developed. In addition new crop strains have been bred and most important of all, amalgamations have taken place. Clearly much of the world's growth in rubber consumption will be taken up by increased synthetic production. But for the forseeable future natural rubber will retain a share of the market.

And what does this mean for the investor? First that it would not be wise to buy rubber shares in the hope for capital growth although naturally there are exceptions. Firms which until now have only a small proportion of the new type rubbers will increase their production and profits as new areas are budded. There may be some growth steam left in this type of company. More important is the fact that there is no reason to expect a slump in natural rubber prices. The present dull conditions that persist are a reaction from the inflated levels of three or four months ago — not a decline to crisis levels.

How to Pick Rubbers

If you decide to buy a rubber share yielding 12% now, we feel that you can expect at least 10% for a long period. We are often asked how to pick rubbers. Specialists in this field use two main guides. The first — the proportion of the estate planted with budded clonal rubber. This is a high yielding strain introduced in the 1920s — it improves yield per acre and reduces costs. The second way? A complicated sounding figure known as 'penny per pound profit as earning % on ordinary' which is simply the gearing.

The figure for UNITED SUA BETONG is about 5¼. This means that if the price of rubber rises by 1d. and costs stay the same, equity earnings would rise say from 30% to 35¼%. Whichever method you decide to use, however, we feel that now is a good time to go bargain hunting in the rubber section of the stock market. Prices have fallen in sympathy with the commodity quotation but they may well begin to rise again soon. So if you have time after New Year celebrations have a look at our own selections in the table we provide below.

	Price	Cover	Yield
Anglo-Indonesian	4s. 9¾d.	0.9	10.1%
Grand Central	1s. 7½d.	1.3*	—
Highlands	5s. 8¼d.	1.4	13.6%
Malaya General	3s. 6d.	1.1	11.9%
United Sua Betong	76s. 3d.	1.5	13.0%

*Cover relates to previous dividend.

Having had a glance forward, we must, we feel, also do the same backwards over the period since we last reported. First thing of importance to note: That the price of rubber in the month of November fell further to an average of just under 26d. per lb. This is the lowest monthly figure for almost two years. For the 11 months of this year the average price works out at 32¾ per lb. and if the current level of around 25d. is held this month, 1960 will provide a mean gross selling price 2d. per lb. better than the 1959 level of 30⅞d.

The law of averages does, in fact, mean that the next accounts of the Malayan rubber companies whose financial year ends on December 31, should for the best part show fully maintained profits despite the recent slide in the commodity with even better performances from those groups which have been able to secure materially higher outputs. This point was brought home in the recent statement from KULIM RUBBER which intimated that the dividend forecast of not less than 25% for 1960 still holds good in spite of the vastly changed position in the commodity market. Considerable sales have largely been made at the higher levels of the earlier months of the year. While the lower prices now prevailing bring automatic reductions in export duty and estate costs. The company has bought an estate of nearly 2,000 acres of pedigree rubber yielding about 900lb. per acre for £300,000 and is providing the finance for this take-over by an issue of new shares to existing shareholders on a one-for-five ration at a price of 2s. 7½d. Including the new issue the company will have a capital of just over £1,500,000 and control of 20,792 acres of rubber with an estimated crop in 1961 of slightly over 12m. lb.

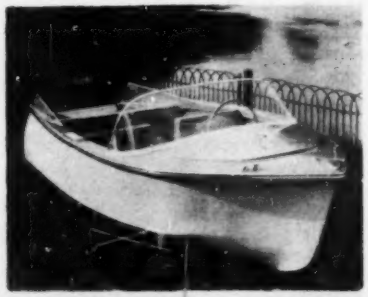
The report from the HENRIETTA RUBBER group also brought home the point that dividend prospects for the efficient producers in the industry are by no means unsatisfactory as might be implied by recent price movements in Mincing Lane. The financial year for this concern ends on March 31 and it paid dividends equal to 55 5/7% for 1959-60. For the current term an interim of 18¾% tax free was paid in October, and the chairman forecast a total distribution of at least 60% gross 'unless any major disaster occurs.'

SAGGA RUBBER has replaced all its old rubber with modern high yielding stock and is now to tackle areas planted just before the Japanese invasion, which suffered from neglect during the years of occupation. Results of this progressive policy is made evident by the annual crop returns which have expanded from the equivalent of 750lb. to almost 1,000lb. per acre in the past 24 months. There is a close connexion between the company and BRADWALL (FMS) RUBBER, a member of the THOMAS BARLOW group. The estate adjoins one of the Bradwall properties and there are two joint directors. Whether this link will be tightened is a matter of conjecture but the Sagga estate would obviously represent a useful acquisition for the larger company.

Activity Not Reflected

Considerable changes have taken place recently in the structure of MERLIMAU PEGOH. Following exchange offers of January and May this year the issue capital of JASSIN (MALACCA) RUBBER and DENNISTOWN RUBBER have been acquired. More recently still the company's majority holding of 65% of the issued capital of MIDDLETON PLANTATIONS was exchanged for £76,800 of stock — almost 10% of the capital — in CRAIGIELEA RUBBER, plus £12,800 in cash. Interest in other offshoots have also been increased. But the accounts do not reflect this activity since the Dennistown take-over and the sale of the Middleton holding were carried through after March 31. Allowing for these changes the company now has an issued capital of just over the £1m. mark and a group rubber area of 1,350 acres. Output in the last trading period on the new basis amounted to 11,170,000 and will probably be a great deal higher this year based on output to date.

Goodyear Tire and Rubber Co. of Canada Ltd. has declared an extra $2 per share along with the usual quarterly dividend of $1 per share.



The Norman Attacker, manufactured by North Manchester Plastics Ltd., is made throughout from Bakelite polyester resin, 11ft. 6in. long, and retails for about £135 complete

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(Adhesives)

for Adhesive & Allied Products Ltd., member of the Baxter Group and manufacturers of a wide range of natural and synthetic based adhesives for the footwear, automotive, packaging, flooring and other industries. Initial salary will depend on experience and qualifications, but will be appropriate to the level of appointment. Removal expenses will be paid.

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Principal duties will be to formulate, develop and test new adhesives for the fields indicated and to operate within an agreed programme. He will also be responsible for maintaining close contact with Production and Sales and for visiting customers as necessary to establish precise technical requirements.

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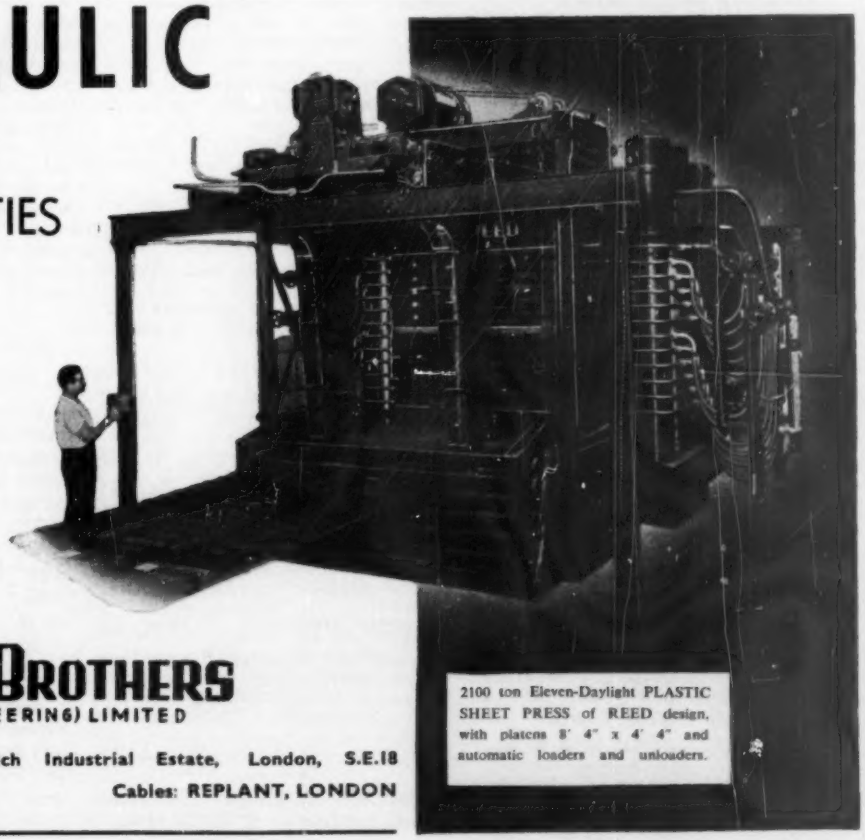

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Rubber Markets

LONDON

Following a declining trend at Singapore, values were marked down, but sellers did not press. A little factory business was noted and dealers were covering and squaring books, but for the most part, the approach of the holidays further restricted interest, in an already very quiet market. Further easiness at Singapore brought another small reduction in quotations at the reopening after the holiday, but the market was slow in the absence of incentive.

Latest prices are as follows:

No. 1 RSS Spot: 25¼d.-25⅜d.

Settlement House:

February 25¼d.-25⅜d.

March 25⅛d.-25¼d.

April/June 25⅛d.-25¼d.

July/September 25d.-25⅛d.

October/December 25d.-25⅛d.

January/March (62) 25d.-25⅛d.

No. 1 RSS cif basis ports:

January 25d.-25⅛d.

February 25d.-25⅛d.

Godown:

January 84⅜ Straits cents nominal.

LATEX

Centrifuged 60% latex per gallon in drums, seller, January, 14s. 4d., cif European ports. Spot, seller 14s. 11d. Bulk, seller, d.w. 14s. 3d. nominal. Creamed, seller, 14s. 1d. nominal, January. Normal, seller, January, 12s. 6d.

NEW YORK

The New York rubber market ruled as under on December 27:

DEALERS' PRICES

	US cents per lb., ex-dock	
	Dec. 27	Previous
No. 1 RSS, January	28⅜n	28⅛b-28⅜a
February	28⅜n	28⅛b-28⅜a
No. 2 RSS, January	28⅛n	28⅛b-28⅜a
February	28⅛n	28⅛b-28⅜a
No. 3 RSS, January	28⅛n	28⅛b-28⅜a
February	28⅛n	28⅛b-28⅜a
No. 1 RSS, Spot ..	28⅜n	28⅜n
No. 3 amber blanket crepe, March ..	25⅛n	25⅛n

FUTURES—REX CONTRACT

	Dec. 27	Prev. Close
Jan. ..	28.80b-28.95a	28.65b-28.85a
Mar. ..	28.80b-29.00a	28.85t
May ..	29.05b-29.10a	28.95t
July ..	29.05b-29.20a	29.00t
Sept. ..	29.05b-29.20a	29.00b-29.10a
Nov. ..	29.05b-29.20a	28.95b-29.05a
Jan. ..	29.05b-29.20a	28.90b-29.00a

Sales: 9. Tone: Steady.

Rubber futures were steady on December 27 in very quiet dealings reflecting the holiday abroad and the lack of interest in New York. Physical rubber was quiet. The undertone was steady.

AMSTERDAM

The Amsterdam rubber market ruled as under on December 27:

No. 1 RMA	Guilders per kilo Dec. 27	Previous
December	2.45	2.45
January	2.50	2.50
February	2.50	2.50
March	2.50	2.50
Jan./March	2.50	2.50
April	2.49	2.49

Sales: Nil. Tone: Quiet.

BANGKOK

No. 1 RSS

The price of No. 1 RSS at Bangkok on December 27 was 27.25 (27.25) US cents per lb.

CEYLON

No. 1 RSS

The price of No. 1 RSS at Colombo on December 27 was 99 Ceylon cents per lb.

The Singapore and Djakarta markets were closed on December 27.

Crop Returns

Unless otherwise indicated, the figures quoted, to the nearest thousand lb., represent crop returns for the month stated and for the number of months of the planting company's financial year to date. Corresponding figures are given in parentheses.

November

THE RUBBER ESTATE AGENCY

Kuala Lumpur—659 (700). 2 mths—1,335 (1,362).

Jeram—292 (330). 2 mths—591 (649).

Tamiang (Malaya)—67 (78). 2 mths—142 (150).

Sungei Kahang—165 (172). 2 mths—343 (351).

Bandar Sumatra—97 (109). 4 mths—370 (400).

Batu Kawan—66 (73). 3 mths—201 (207).

Buntar—121 (123). 11 mths—1,250 (1,206).

Kepitigalla—43 (58). 8 mths—467 (435).

Langkat Sumatra—90 (70). 11 mths—856 (810).

Sungei Bahru—146 (135). 5 mths—711 (655).

Tambira—115 (115). 5 mths—551 (573).

Tanjong Malim—326 (359). 5 mths—1,845 (1,921).

Amalgamated Rubber—46 (33). 11 mths—433 (353).

Java Rubber—73 (68). 11 mths—826 (803).

Soember Ajoe—15 (12). 2 mths—35 (23).

Sennah—101 (66). 11 mths—1,498 (1,516).

THOMAS BARLOW

Bradwall (FMS)—157. 11 mths—1,669 (1,480).

Chersonese (FMS).—75. 11 mths—755 (696).

Highlands and Lowlands.—2,069. 11 mths—21,635 (20,956).

Krian.—12. 11 mths—77 (107).

Sungei Krian.—143. 11 mths—1,741 (1,716).

Muar River.—463. 8 mths—3,433 (3,446).

Frederick W. Moyer has been elected treasurer of B. F. Goodrich.

Patent Specifications

The following information is prepared from published Patent Specifications by permission of the Controller of H.M. Stationery Office. The full Specifications can be obtained from the Patent Office, 25 Southampton Buildings, W.C.2, at 3s. 6d. per copy (including postage).

Tube Extrusion

No. 853,460. Lonza Electric and Chemical Works Ltd. Application and Filed, June 17 1958. Application in Switzerland, June 19 1957. Published, November 9 1960.

The difficulty of controlling the size of blown extruded thermoplastic tubes can be overcome by entering the inflated tube into a sizing tube of novel construction, cooling and solidifying it therein and drawing off. The final size is therefore determined by the internal diameter of the sizing means, and independent of other variables.

The sizing tube provides a downward flow of liquid for casting and lubricating the extruded tube so that this is solidified before leaving the sizing tube.

Foam Rubber Cushions

No. 853,453. Firestone Tire and Rubber Co. Application and Filed, October 3 1958. Application in USA, January 28 1958. Published, November 9 1960.

Cushions have conventionally been moulded with convex edges so that when covered the edges of the cushion are squeezed to fill the cover completely. The invention described takes an opposite view, and the cushions are moulded with the sides concavely rounded so that the top and bottom edges protrude laterally beyond the central or edge portions of the sides. When such a cushion is covered with a cover whose lateral dimensions are shorter than the corresponding dimensions of the cushion the protruding edges of the cushion are forced laterally inward by the cover to produce localized portions of compressed rubber at the edges. The result is that the covered cushion has increased firmness at the very points where added firmness is needed, and is a better fit in the cover.

Soviet Expansion Plans for Heavy Industry

Budget plans announced in Moscow include a big spending programme for heavy industry. Investment in chemicals will be up by 42% on this year.

The chemical industry should increase output by 14½% next year, with plastics up by 32%, synthetic rubber by 30%, and synthetic fibres by 20%.

Firestone Fire

A quantity of rubber caught fire at Firestone's Brentford, Middlesex, factory on Wednesday night (December 28). Fifty workers on night shift were evacuated and the outbreak was under control in 15 minutes.

Industry INTELLIGENCE

Technical Data

Monomer X970 Plasticizer

Polysar Technical Report No. 9:11C issued recently by Polymer Corporation Ltd., and available from Polymer (UK) Ltd., Walbrook House, Walbrook, London, E.C.4, describes a novel method of obtaining hard, easy processing rubber compounds using Monomer X970. This is one of a group of materials which function as plasticizer during processing, and polymerize during cure to yield hard vulcanizates with good physical properties.

These compounds are easy to process and their vulcanizates have properties which make them suitable for applications beyond the scope of conventionally prepared hard compounds.

Antioxidant For Polythene

The oxidation of polythene during processing at elevated temperatures is a disadvantage which can be overcome by the addition of as little as 0.1% of Nonox WSP. This has no adverse effect on other properties and has been shown to confer long-life protection while being essentially non-staining and non-bleeding. Results of tests carried out on Alkathene are given in Technical Information Sheet Rubber PC/R.72 available from the Dyestuffs Division of I.C.I. Ltd.

On account of the difficulty of ensuring even dispersion of the small dosage of Nonox WSP, it will be found preferable to prepare a masterbatch at 10% strength. This can be accomplished either by direct incorporation into polythene on an open roll mill or internal mixer, or by tumbling followed by homogenization on a mill or in a mixer.

A masterbatch form of Nonox WSP is available from I.C.I., Plastics Division, as Alkathene Antioxidant Masterbatch D.

Iridon ABS

One of the latest additions to the range of thermoplastic sheeting supplied by Iridon Ltd., 75 Grosvenor Street, London W.1 (one of the Commercial Plastics Group of Companies) is Acrylonitrile-Butadiene-Styrene copolymer. This is an extruded material with extremely high impact strength and good ageing properties. It can be vacuum formed on conventional equipment, possesses good deep drawing qualities and can be worked in the same manner as high impact polystyrene for all other purposes.

Available in six colours in sheets 72in. x 36in. and thicknesses from 0.040 to 0.187in., Iridon ABS is resistant to most dilute inorganic and organic acids, alkalis and mineral and vegetable oils.

Ancablo A

A leaflet describing the use of Ancablo A and giving recipes for three natural rubber sponge compounds was issued by Anchor Chemical Co. Ltd., Manchester 11, some time ago (*RJIP* September 7 1957, 329).

Bulletin 157/R/60, issued recently gives details of some of the sponge compounds developed since that time by the Service Laboratory. These compounds are based on natural rubber, SBR, butyl, Neoprene GN and Neoprene WRT.

Ancablo has gained wide acceptance as a powerful inorganic blowing agent, producing sponge rubbers with a fine uniform cell structure.

Publications

Carbon Black Abstracts

The latest issue of Carbon Black Abstracts, Vol. 9, No. 3, covers the period July to September 1960, and gives abstracts of patent and other published literature relating to uses of carbon black. These are prepared by the Technical Information Service of the research laboratories of Godfrey L. Cabot Inc., 38 Memorial Drive, Cambridge 42, Mass., and this volume contains 193 references which are arranged in the same way as previous numbers. Four sections deal respectively with production and processing, applications, fundamental properties and economics, statistics and news of the industry. The second section is further subdivided into groups referring to rubber blacks, natural rubber, carbon black in plastics and synthetic rubber, colour blacks, electrical applications and miscellaneous uses.

Foams and Latex

Volume 26, No. 5, of the Vanderbilt News contains articles comparing the properties of currently available foam cushioning materials and on uses of Vanderbilt product in foam and other latex applications.

Information is given on the results of laboratory tests on the cushioning of latex and polyurethane foams and a comparison is made between the compression modulus and hysteresis properties of these materials which relate to the comfort characteristics of foam cushions.

Formulations are given for latex foam rug underlay which have been prepared and tested in the Vanderbilt laboratories using all synthetic and predominantly synthetic compounds.

Laboratory studies on the use of antioxidants in butyl latex are described and a review of formula development and compounding procedures for obtaining easy processing and optimum physical properties in 100% SBR latex foam completes the booklet.

Light Coloured Rubber

Compounding light coloured rubber rolls is the title of the latest Hi-Sil Bulletin (No. 23) issued by the Columbia-Southern Chemical Corporation, Pittsburgh 22, Pa. This is an article reprinted from *Rubber Age* and written by Ralph F. Wolf and Robert R. Meltz and is a practical guide to production stocks for rubber covered rollers, based on four commonly used elastomers — natural, neoprene, Hycar and Thiokol.

It is important that rubber rolls should have the right combination of durability and hardness. According to the service requirement they must have either a non-slip or good grip surface, must be resistant to the chemicals to be encountered and must grind and polish easily. Other problems dealt with in the paper include avoidance of smudging, overcoming building tack and the use of diethylene glycol for water resistance.

Machines, Materials and Equipment

Lorry Loader

An inexpensive loading device has been produced to facilitate the loading of lorries with sacks, bales, and similar loads.

It consists of a pivoted arm, fitted with a cradle to take the sack or other load, is operated hydraulically from a pump and power take off unit attached to the engine of the vehicle and is manufactured by H. C. Pope Ltd., 8 Elm Street, Northampton.

The whole device is arranged for easy installation and for convenient stowage when attached, but out of use. Because of its quick lifting and automatic return action, it is claimed that a 7-ton lorry can be loaded in 15 minutes.

Novel Hand Truck

A new stillage truck has been introduced in which a lift of 1¼in. is obtained by moving a handle across the body of the truck. This provides a leverage which enables a weight of 6cwt. to be raised with very little effort. The effect is obtained by the rotation of two movable steel tubes about two fixed tubes. This truck is manufactured (under the trade name Rotalift) by Towers (Sunderland) Ltd., Finchale Road, Framwellgate Moor, Co. Durham.

Material Prices

Prices of materials appear regularly in RUBBER JOURNAL AND INTERNATIONAL PLASTICS on the last Saturday of each month. It will be appreciated if suppliers will give notification of any price changes and additions to or deletions from their range. Comments on the present materials and classifications are invited in order that the list may be made of maximum service to our readers.

Unless otherwise stated prices are per lb. In most cases prices vary according to quantity. pc—per cwt pg—per gallon pt—per ton ag—according to grade xs—ex-store xw—ex-wharf dp—duty paid sp—special prices for contracts del—delivered cp—carriage paid

Accelerators

Alpha	5s. 8d.—6s. 4d.
Ancap cp	2s. 10d.—3s. 8d.
Ancap Zinc Salt cp	3s. 2d.—4s. 2d.
Ancatax cp	3s. 9d.—4s. 6d.
Ancazate BU cp	6s. 3d.—6s. 9d.
Ancazate ET cp	5s.—6s. 4d.
Ancazate ME cp	6s. 2d.—7s.
Ancazate Q cp	6s. 1d.—6s. 4d.
Ancazate XX cp	5s. 1d.—5s. 9d.
Ancazide ET cp	5s. 9d.—6s. 6d.
Ancazide IS cp	7s. 6d.—8s. 6d.
Ancazide ME cp	4s. 6d.—5s.
Cu D.D.	9s. 3d.—10s.
D.Bu.D	10s. 6s.—11s. 3d.
D.D.D	12s. 2d.—13s. 3d.
D.P.G. cp	3s. 5d.—4s. 2d.
D.O.T.G. cp	4s. 5½d.—4s. 9d.
Dibenzo GMF	27s.—28s. 6d.
Furbac cp	5s.—5s. 9d.
Gamma	10s. 6d.—11s. 3d.
GMF	27s.—28s. 6d.
L.M.D	9s. 3d.—10s.
M.Z.I	3s. 6d.—4s. 2d.
N.Bu.D	10s. 6d.—11s. 3d.
Ni.P.D	12s. 2d.—13s. 3d.
P.P.D	12s. 2d.—13s. 3d.
P.T.D	12s. 2d.—13s. 3d.
Robac 22	10s.—11s. 3d.
Robac 44	9s. 1d.—9s. 10d.
S.P.D	9s. 3d.—10s.
Suparac M	9s. 7d.
T.B.U.T	15s.—16s.
T.E.T	6s. 6d.—7s. 4d.
Thiuram P.25	15s.—16s.
T.M.S	7s. 8d.—8s. 6d.
T.M.T	5s. 4d.—6s. 3d.
Vulcacit CZ deldp	7s. 1d.
Vulcacit F deldp	4s. 8½d.
Vulcacit NP deldp	11s. 2d.
Vulcacit P Extra N deldp	8s. 1d.
Z.B.E.D	15s.—16s.
Z.Bu.D	6s. 3d.—7s. 3d.
Z.D.C	5s. 1d.—5s. 7d.
Z.L	9s. 3d.—10s.
Z.P.D	9s. 3d.—10s.

Antioxidants and Antiozonants

Agerite AK cp	3s. 6½d.—4s. 5½d.
Agerite HPX cp	4s. 5d.—4s. 10d.
Agerite Powder cp	3s. 7d.—4s.
Agerite White cp	8s. 10d.—9s. 7d.
Antioxidant 2246 cp	11s. 8d.—12s. 4d.
Antioxidant 425 cp	18s. 6d.—19s. 3d.
Antioxidant SP cp	3s. 8d.—5s.
BLE-25	3s. 7d.—4s. 5d.
BXA	3s. 6½d.—4s. 5½d.
Naugawhite	4s. 9d.—5s. 6d.
Octamine	3s. 9d.—4s. 6d.
Polygard	3s. 7½d.—4s. 5d.
UOP 88 xs	9s. 3d.
UOP 288 xs	9s. 3d.
Wing-Stay S	3s. 8d.—4s.
Wing-Stay T	4s. 10d.—5s. 6d.
Wing-Stay 100	10s. 6d.—11s. 6d.

Compounding Ingredients

Barytes ptag	£10—£40
Calcium Silicate del	9d.—10½d.
Calcene ptxw	£52—£69 10s.
Carbonate, Light Mg. ptsp	£97
Carbonate, Actidated Ca. pt	£28—£30
Carbon Blacks:	
Conductex SCF	1s. 2½d.
Continental AMPC ag	11½d.—1s. 4½d.
Continex FEF ag	9½d.—10½d.
Continex HAF ag	10½d.—11d.
Continex HMF ag	9½d.—9½d.
Continex ISAF ag	1s. 0½d.—1s. 0½d.
Continex SRF, SRF-NS ag	8½d.—9d.
Dixie 45 GPF xs	6½d.—7½d.
Dixie 60 HAF xs	7½d.—8½d.
Dixie 70 ISAF xs	9½d.—10½d.
Dixiedensed HM MPC xs	11½d.
Dixiedensed 77 EPC xs	11½d.
Furnex SRF	9d.
Kosmos 45 GPF	6½d.—7d.
Kosmos 60 HAF	7½d.—8d.
Kosmos 70 ISAF	9½d.—10d.
Magecol 888 cp	7.60d.
Micronex MPC	11½d.
Micronex W6 EPC	11½d.
Philblack A. FEF	7d.—8d.
Philblack E. SAF	1s. 0½d.—1s. 1d.
Philblack G. GPF	6½d.—7½d.
Philblack I. ISAF	9½d.—10½d.
Philblack O HAF	7½d.—8½d.
Regal 330	7½d.—8d.
Regal 600	9½d.—10d.
Statex B. FF	10½d.
Statex R. HAF	11d.
Statex 93 HMF	9½d.
Sterling SO FEF	7d.—7½d.
Sterling V. GPF	6½d.—7d.
Ukarb 327 GPF xs	6½d.—7½d.
Ukarb 340 xs	7½d.—8½d.
Vulcan 6 ISAF	9½d.—10d.
Vulcan C CF	11d.—11½d.
Vulcan 3 HAF	7½d.—8d.
Vulcan XXX SCF	1s. 2½d.—1s. 2½d.
China Clay ptagxs	£12—£68 10s.
Factice Dark cp	1s. 0½d.—1s. 7d.
Factice Whitbro cp	1s. 3½d.—1s. 11d.
Factice White	1s. 4½d.—1s. 8½d.
Kieselguhr Spanish White ptxs	£37 12s. 6d.
Lithopone 30% ptxs	£68 10s.
Manosil VN3 pt	£120 5s.—£150 5s.
Micafine Powdered Mica ptxs	£67 10s.
Ochre Yellow pcxs	£1 19s.
Oxide Light Mg ptsp	£245
Oxide Red pcxs	£4 3s.
Oxide Titanium 98% pcxs	£8 8s
Rutiox CR pcxs	£9 3s
Rubber Gen. Gran. Mineral ptxs	£35 5s.
Shellac Dewaxed xs	1s. 9d.—2s. 3d.
Shellac Orange xs	2s.—3s. 9d.
Silica Hydrated ptxs	£113
Sulphur Manox Insoluble del	1s. 9d.
Sulphur Powdered ptdel	£20 17s.
Sulphur Sublimed Flowers ptxs	£52 10s.
Talc Norwegian ptxs	£13 7s. 6d.
Talc Italian ptxs	£30 2s. 6d.
Tufknit Durham CS	8½d.—10½d.
White Lead Dry ptdelsp	£112 5s.
Whitetex 2 Clay ptxs	£45 10s.
Whiting ptxs	£5 9s. 6d.—£7 7s. 6d.
Zinc Oxide pcdel	£6

Plasticizers and Softeners

Abalyn pc	220s.—271s.
Al Stearate ptxwdp	£253 10s.
Bi.oflex 102 pt	£513—£568
Butyl Ricinoleate	2s. 6d.—2s. 6½d.
But. Ac Ricinoleate	3s. 0½d.—3s. 1½d.
Butyl Stearate pt	£277—£282
Ca. Stearate ptcp	£220
Diallyl Phthalate	3s. 11d.—4s. 11½d.
Dialkyl Phthalate pt	£221—£222
Dibutyl Phthalate pt	£203—£204
Dibutyl Sebacate	5s. 9½d.
DiOA pt	£354—£357
DiOS sp	5s. 0½d.—5s. 2d.
DOA pt	£414—£420
DOP pt	£276—£277
DOS sp	5s. 7½d.—5s. 9d.
Disobutyl Phthalate pt	£196—£197
Diisooctyl Phthalate pt	£221—£222
Dinonyl Phthalate pt	£211—£212
DNS sp	5s. 2½d.—5s. 4½d.
Ester Gum pcag	130s.—150s.
Flexol 3GO	4s. 8d.
Hercolyn pc	242s.—294s.
Lankroflex ED3	3s. 2d.—3s. 2½d.
Lankroflex 29 pt	£216—£217
Lead Stearate ptxwdp	£223 10s.
Methyl Ricinoleate	2s. 4d.—2s. 4½d.
Me. Ac Ricinoleate	2s. 11½d.—3s. 0½d.
Polyglycol Oleate 400 pt	£285
Reomol D79A pt	£354—£357
Reomol D79S sp	5s. 0½d.—5s. 2d.
Reoplex 100 sp	6s. 1½d.—6s. 2½d.
Reoplex 110 sp	5s. 10d.—6s. 5½d.
Reoplex 220 sp	5s. 6½d.—5s. 8d.
Reoplex 300 sp	7s. 2d.—7s. 3½d.
Reoplex 400 sp	4s. 2½d.—4s. 4d.
Rosin Oil pgag	8s.—18s.
Triphenyl Phosphate pt	£366
Tricresyl Phosphate pt	£233
Trixylyl Phosphate pt	£200
Zinc Stearate ptdel	£220—£230

Solvents and General Chemicals

Acetic acid ptdel	£97—£106
Acetic Anhydride ptdel	£128
Acetone ptdel	£75—£120
Alcohol:	
Absolute 74.5 op pgdel	4s. 0½d.—4s. 4½d.
Butyl pt	£132—£193 10s.
sec-Butyl ptdel	£128—£168
Ter-Butyl ptdel	£172—£195
Isopropyl Tech. 99% pgdel	5s.—6s. 5½d.
Butyl 'Carbitol' pt	£283
Butyl Acetate pt	£159—£217
Caprylic Acid ptdel	£395
Carbon Bisulphide ptxs	£71 10s.
Carbon Tetrachloride pg	12s. 4d.—20s.
'Cellosolve' Acetate pt	£250
Cresol m- 98% del	4s. 9d.
Cresol o- 30/31°C. del	1s.
Cresol p- 34/35°C. del	5s.
Ethyl Acetate pt	£131—£189
Formaldehyde ptdel	£40
Glycol:	
Diethylene pt	£158
Ethylene pt	£132
Polyethylene 200 pt	£214
,, 300 pt	£214
,, 400 pt	£214
,, 1,500 pt	£264
,, 4,000 pt	£274
,, 6,000 pt	£294
Isopropyl Acetate pt	£126—£184
Isobu yl Acetate 80% pt	£126—£185
Lauric Acid ptdel	£273
M.E.K. ptdel	£134 10s.—£143 10s.
M.I.B.K. ptdel	£166—£209
Methylated Spirits pgdel:	
Industrial 61op	5s. 5½d.—7s. 2d.
,, 74 op	6s. 3d.—7s. 11½d.
'Q' grade 68 op	8s. 5½d.—10s. 5d.
Pyridinised 66 op	5s. 10d.—7s. 6½d.
Denatured Methanol	3s. 9½d.—4s. 10d.
Monoethanolamine pt	£252
Naphtha Coal tar pg:	
Heavy 90—190	4s.
Light 90—160	5s. 1d.
Palmitic Acid ptdel	£147
Phenol pldel	1s. 4d.—1s. 7d.
Pyridine pg	16s. 6d.
Stearine ptag	£108—£130
Toluol Pure/Nitration pg	5s. 8d.
Toluol 90's pg	5s.
Triethanolamine pt	£224
Xylol 2/30 pg	5s. 9d.

An initial appointment has been made of 22 UK distributors for Fablonite, Fablon's latest decorative laminate.

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

FI-GLASS (806,785) Parts included in Class 12 of land vehicles, aircraft and of watercraft, all made of moulded fibre glass; and fairings, vehicle bodies and boat hulls, all of fibre glass. Fi-Glass Ltd., The Larches, Green Street Green, Farnborough, Kent. (Class 12; December 7 1960).

PEPSULIN (805,628) Expanded polystyrene plastics included in Class 17 in the form of sheets or of shaped sections. Commerce Factors (G.B.) Ltd., Gallows Park, Torpoint, Cornwall. (Class 17; December 7 1960).

MYLAR (807,769) Non-mouldable plastics included in Class 17 in the form of films. E. I. Du Pont De Nemours and Co., 1007 Market Street, Wilmington, State of Delaware, United States of America. Address for service is c/o Marks and Clerk, 57 and 58 Lincoln's Inn Fields, London, W.C.2. (Class 17; December 7 1960).

SWIMPLE (804,257) Linings made of plastics for swimming pools. Arnolds (Branbridges) Ltd., Branbridges, Paddock Wood, Tonbridge, Kent. (Class 19; December 7 1960).

THAMES-NOILPLY (B801,920) Plywood and plywood faced with plastics. Thames Plywood Manufacturers Ltd., Harts Lane, Barking, Essex. (Class 19; December 7 1960).

CRAYBOND (B798,236) Non-metallic building materials surfaced with films of plastics. Greenwich Plastics Ltd., Willington Quay, Wallsend-on-Tyne, Northumberland. (Class 19; December 7 1960).

(805,833) Parts included in Class 12 of aircraft, watercraft or of land vehicles, all being goods made principally of acrylic sheet. Imperial Chemical Industries Ltd., Imperial Chemical House, Millbank, London, S.W.1. (Class 12; November 23 1960).

MONAFOAM (778,613) Foamed rubber, foamed synthetic rubber and foamed plastics included in Clas 17. Irish Rubber Products Ltd., The Glen, Waterford, Republic of Ireland. Address for service is c/o Marks and Clerk, 57 and 58 Lincoln's Inn Fields, London, W.C.2. (Class 17; November 23 1960).

SPEAREX (807,448) All goods included in Class 18 made of leather, of artificial leather or of plastics. E. and W. Spearman Ltd., 159-165 Great Portland Street, London, W.1. (Class 17; November 23 1960).

TADPOLE (799,550) Spillbooms, being devices made of rubber or of artificial rubber, for use in the conservation and recovery of oil spilt on the water. The Goodyear Tire and Rubber Co., Akron 16, State of Ohio, United States of America. Address for service is c/o Marks and Clerk, 57 and 58 Lincoln's Inn Fields, London, W.C.2. (Class 17; November 23 1960).

CARBELON (809,199) Sheets, films, rods, bars, discs, plates, blocks, tubes and shaped sections all made of plastics and included in Class 17. May and Baker Ltd., Dagenham, Essex. (Class 13; November 23 1960).

PLASTAWELD (B767,488) Emulsions of plastics for application to building surfaces prior to plastering. J. Manger and Son, Ltd., 57d Kingsland High Street, London, E.8. (Class 19; November 23 1960).

CLAMELLA (807,106) Stoppers and closures, all made from cork or plastics. Flexile Metal Co., Ltd., trading also as Flexile of Stevenage, Bessemer Drive, Stevenage, Hertfordshire. (Class 20; November 23 1960).

WESLON (801,451) Containers made of plastics and included in Class 21, bottles, tumblers (being drinking glasses), dishes jugs, table-serving utensils (not of precious metal or coated therewith, table plates, cups, saucers, trays included in Class 21 and non-electric pans. West London Catering Services Ltd., 204 Uxbridge Road, Shepherds Bush, London, W.12. (Class 21; November 23 1960).

Increases of Capital

Yorkshire Rubber Co. Ltd. (363,623). 257 Manchester Road, Bradford.—Increased on March 17 1960, by £6,000, in £1 ordinary shares, beyond the registered capital of £1,000.

Rutland Plastics Ltd. (560,131). Engineers, etc., 42 Coldoverton Road, Oakham, Rutland. — Increased on December 10 1960 by £2,500 in £1 ordinary shares, beyond the registered capital of £5,000.

Valley Tools and Plastics Ltd. (567,463). 1 Fitzroy Square, W.1.—Increased on April 20 1960 by £20,000 in £1 ordinary shares, beyond the registered capital of £5,000.

Dennis Rose and Co. (Rubber) Ltd. (590,238). Grinding and granulating of waste rubber, etc., Globe Works, South Bridge Road, Northampton.—Increased on April 5 1960 by £5,000 in £1 shares, beyond the registered capital of £5,000.

Chautard & Co. (Rubber) Ltd. (610,089). Plantation House, E.C.3.—Increased on March 24 1960 by £50,000 in £1 ordinary shares, beyond the registered capital of £100,000.

Muar River Rubber Co. Ltd. (164,670). Plantation House, Mincing Lane, E.C.3. Increased on March 23 1960 by £200,000 in 2s. ordinary shares, beyond the registered capital of £1,000,000.

Gordon Low (Plastics) Ltd. (643,931). Finsbury Pavement House, 120 Moorgate, E.C.2. Increased on April 4 1960, by £1,000 in £1 ordinary shares, beyond the registered capital of £1,000.

United Planters' Holdings Ltd. (651,918). Adelaide House, King William Street, E.C.4. Increased on March 29 1960 by £920,558 in £1 shares, beyond the registered capital of £100. Converted into Public Company March 29 1960.

Henry J. Peters (Billericay) Ltd. (528,794). Plastic goods manufacturers, etc. 1 Fitzroy Square, W.1.—Increased on April 20 1960 by £24,000 in £1 ordinary shares, beyond the registered capital of £1,000.

Shropshire Tyre Co. Ltd. (247,496). Bell Lane, Abbey Foregate, Shrewsbury.—Increased on March 23 1960 by £5,000 in £1 ordinary shares, beyond the registered capital of £5,000.

London and Asiatic Rubber and Produce Co. Ltd. (95,414). 1-4 Great Tower Street, E.C.3. Increased on April 29 1960 by £1,000,000 in 2s. ordinary shares, beyond the registered capital of £1,500,000.

Changes of Name

Tyres, Southampton (1957) Ltd. (594,124), 7 Brunswick Place, Southampton.—Name changed to Tyres (Dutfields) Ltd., on April 21 1960.

Recon (Overseas) Ltd. (511,567), flexible plastic manufacturers, etc., Plansel Works, Albert Drive, Sheerwater, Woking, Surrey. —Name changed to Recon (Pipelines) Ltd. on May 12 1960.

A. Tout and Sons Ltd. (370,394), manufacturers and dealers in rubber soles, etc., 18 Summerville Road, Bradford, 7.—Name changed to Recticel Ltd. on May 5 1960.

NEW COMPANIES

E.T.C. Ltd. (676,691). — December 1. Capital: £10,000 in £1 shares. To carry on the business of importers, concessionnaires, dealers in and merchants of tyres, etc. The first directors are to be appointed by the subscribers. Regd. office: Allen House, Newarke Street, Leicester.

Kew Bridge Tyre Services Ltd. (676,769). —December 2. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in rubber tyres, etc. William T. Matthews, 31 Whitton Dene, Houndslow, is the first director. Regd. office: 24/25 Princes Street, W.1.

Prodflag Ltd. (676,423). — November 29. Capital £100 in £1 shares. To carry on the business of manufacturers of and dealers in tyres, etc. The first directors are to be appointed by the subscribers. Secretary: Thomas A. Herbert, 156 Strand, W.C.2.

Valves (Inflatables) Ltd. (676,206). — November 25. Capital: £500 in £1 shares. To carry on the business of manufacturers and dealers in plastics, modelling and moulding materials, etc. The first directors are: Max S. Bing, 42 Hillfield Court, Belsize Avenue, N.W.3; Norman P. Parrott, 76 Marylebone High Street, W.1. Regd. office: 76 Marylebone High Street, W.1.

Refa (Gt. Britain) Ltd. (676,560).—November 30. Capital: £1,000 in £1 shares. To carry on the business of manufacturers of materials and components used in packing and protection of produce of all kinds, etc. The first directors are: Arthur L. Cooney, Floris E. Vos and Maurits Henny. Solicitors: Warmingtons and Trevor Jones, Albany Courtyard, W.1.

Avondale Plastics Ltd. (676,481). — November 30. Capital: £20,000 in £1 shares. To carry on the business of developers of plastic or other processes, etc. The directors are: Eric Hamilton-Walker, Heatherside, Vigo Lane, Yateley, Hants.; Marion R. Chamberlain, 1 Trebeck Street, W.1. Regd. office: 17 Oxendon Street, S.W.1.

Garner Plastics Ltd. (676,492). November 30. Capital: £3,000 in £1 shares. To carry on the business of manufacturers, processors, moulders and fabricators of and dealers in plastic substances and materials of all kinds, etc. The first directors are to be appointed by the subscribers. Regd. office: 221 Rotherhithe New Road, S.E.16.

Bromley Tyres and Accessories Ltd. (675,084).—November 15. Capital: £1,000 in £1 shares. The first directors are: James Spencer, 4 Clairview Road, S.W.16; Frederick R. P. Martin, 19d Hope Park, Bromley, Kent. Solicitors: Judge and Priestley, Bromley.

Herbert Connor (Kent) Ltd. (674,882).—November 11. Capital: £100 in £1 shares. To carry on the business of importers, exporters, distributors and dealers in plastic, plastic scrap, etc. The first directors are: Michael Connor, 120 Beaufort Park, N.W.11; Desmond C. Rowden, 34 Tankerton Road, Whitstable; Ronald C. Dengate and Cyril Dengate. Regd. office: Streamwalk, Whitstable.

Multifabs Ltd. (674,987).—November 14. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in plastic materials and plastic goods of all kinds, etc. The first directors are: Colonel Arthur K. Haslehurst, 11 Louvain Road, Derby; Gordon A. Moult, 25 Wardwick, Derby. Secretary: K. R. Oakley. Regd. office: 25 Wardwick, Derby.

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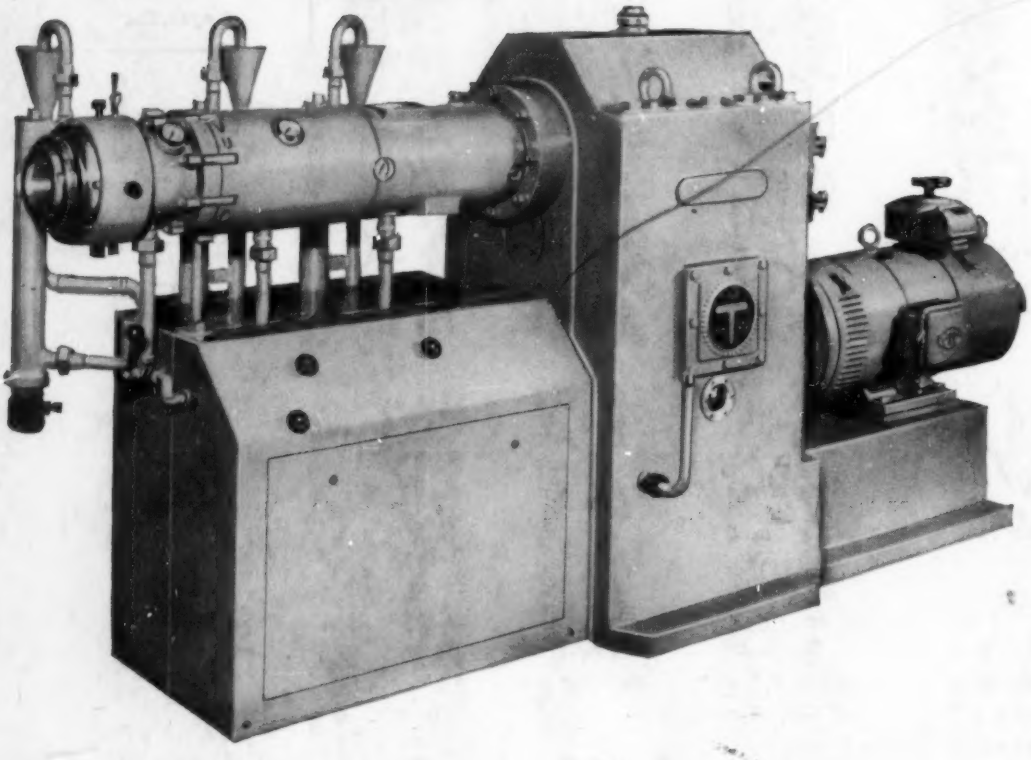

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